IEI Technology Corp.

MODEL:

IMBA-9654

LGA775 Intel® ATX motherboard supports Core™2 Quad, Core™2 Duo CPU with 1066 MHz FSB, 8 GB of DDR2, dual GbE support, six 3.0 Gbps SATA II ports, six COM, one PCIe x16, one PCIe x16 and five PCI expansion slots

User Manual

Rev. 1.00 MARCH 2008

RoHS Lead Free

Revision

Date	Version	Changes
2008-03-31	1.00	Initial release

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Manual Conventions

WARNING!

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word “warning” is written as “**WARNING**,” both capitalized and bold and is followed by text. The text is the warning message. A warning message is shown below:

WARNING:

This is an example of a warning message. Failure to adhere to warning messages may result in permanent damage to the IMBA-9654 or personal injury to the user. Please take warning messages seriously.

CAUTION!

Cautionary messages should also be heeded to help reduce the chance of losing data or damaging the IMBA-9654. Cautions are easy to recognize. The word “caution” is written as “**CAUTION**,” both capitalized and bold and is followed. The italicized text is the cautionary message. A caution message is shown below:

CAUTION:

This is an example of a caution message. Failure to adhere to cautions messages may result in permanent damage to the IMBA-9654. Please take caution messages seriously.

NOTE:

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes. Notes are easy to recognize. The word “note” is written as “**NOTE**,” both capitalized and bold and is followed by text. The text is the cautionary message. A note message is shown below:

NOTE:

This is an example of a note message. Notes should always be read. Notes contain critical information about the IMBA-9654. Please take note messages seriously.

Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IMBA-9654 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the IMBA-9654 package.

- 1 x IMBA-9654 single board computer
- 3 x SATA power cables
- 6 x SATA cables
- 2 x Dual RS-232 cable
- 1 x Single RS-232 cable
- 1 x I/O shielding
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x QIG (quick installation guide)

Images of the above items are shown in **Chapter 3**.

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Chapter

1

Introduction

1.1 Overview

Figure 1-1: IMBA-9654 Motherboard

The IMBA-9654 ATX form factor motherboard is a LGA775 Intel® Core™2 Quad, Core™2 Duo, Pentium® D, Pentium® 4 or Celeron® D platform with a 533 MHz, 800 MHz or 1066 MHz front side bus (FSB). Up to 8.0 GB of DDR2 SDRAM and up to six SATA II hard disk drives (HDD) are supported. High-performance PCI Express (PCIe) Gigabit Ethernet (GbE) connectivity is integrated into the system. One PCIe x16, one PCIe x4, five PCI slots and eight USB 2.0 connectors (four external and four internal) provide flexible expansion options. Added system security is provided with Trusted Platform Module (TPM v1.2) support.

1.1.1 IMBA-9654 Features

Some of the IMBA-9654 features are listed below.

- Supports LGA775 Intel® CPUs including:
  - Intel® Core™2 Quad
  - Intel® Core™2 Duo
  - Intel® Pentium® D
  - Intel® Pentium® 4
  - Intel® Celeron® D

- Maximum FSB of 1066 MHz
- Supports four 240-pin 533 MHz, 667 MHz or 800 MHz 2.0 GB (max.) DDR2 memory modules
- Added security with support for TPM v1.2
- Expansion slots include:
  - One PCIe x16 slot
  - One PCIe x4 slot
  - Five PCI slots
- Six SATA II drives with transfer rates of 3.0Gb/s supported
- Eight USB 2.0 devices supported
- Dual PCIe GbE Ethernet connectors
- PICMG 1.3 form factor
- RoHS compliant
- Supports ATX power supplies

1.2 IMBA-9654 Overview

1.2.1 IMBA-9654 Overview Photo

The IMBA-9654 has a wide variety of peripheral interface connectors. **Figure 1-2** is a labeled photo of the peripheral interface connectors on the IMBA-9654.

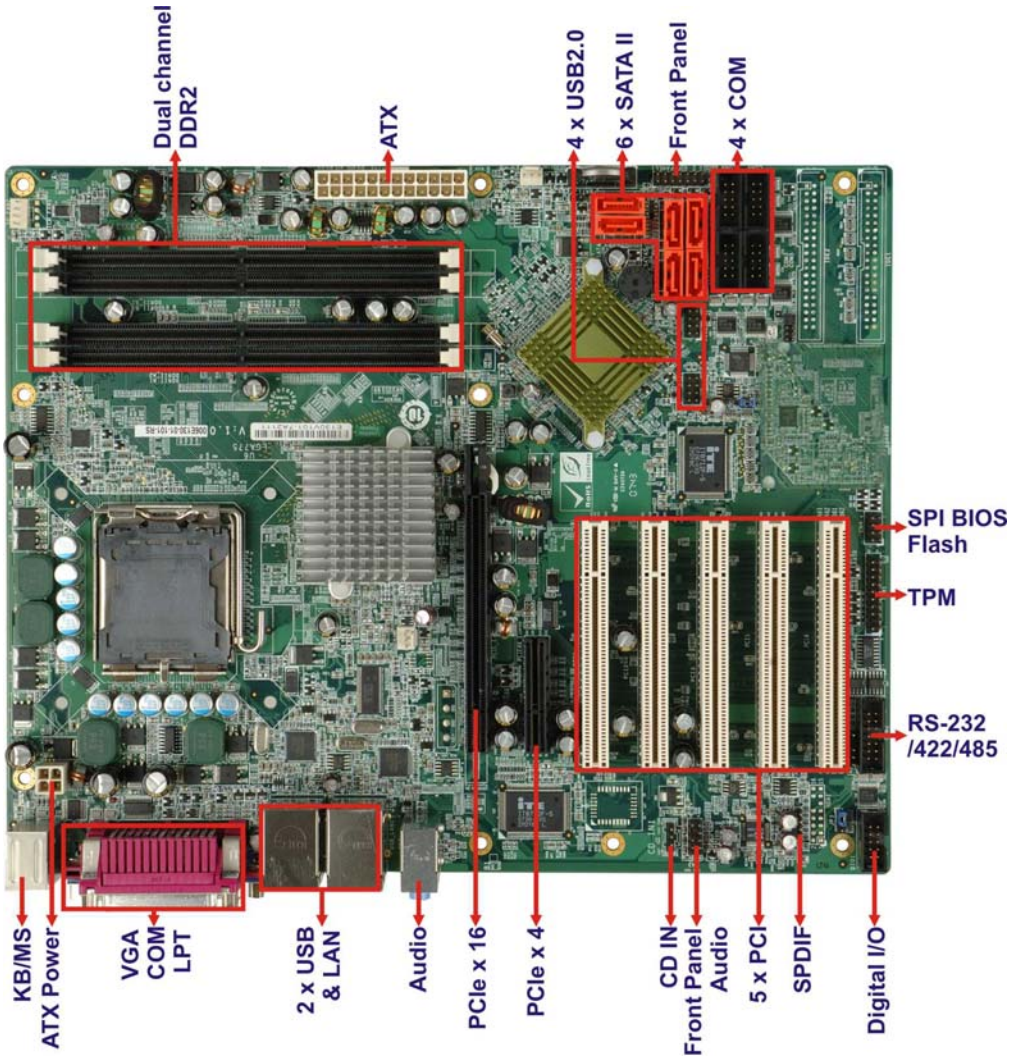

Figure 1-2: IMBA-9654 Overview [Front View]

1.2.2 IMBA-9654 Peripheral Connectors and Jumpers

The IMBA-9654 has the following connectors on-board:

- 1 x ATX +12V power connector
- 1 x ATX power connector
- 1 x Audio connector
- 1 x CompactFlash® Type II (CF Type II) socket
- 1 x Digital input/output (DIO) connector
- 3 x Fan connectors
- 1 x Front panel connector

- 1 x Infrared interface connector
- 5 x PCI expansion slots
- 1 x PCIe x16 expansion slot
- 1 x PCIe x4 expansion slots
- 6 x Serial ATA II (SATA II) drive connectors
- 5 x Serial port connectors
- 1 x SPDIF connector
- 1 x SPI flash connector
- 1 x TPM connector
- 2 x USB 2.0 connectors (support four USB devices)

The IMBA-9654 has the following external peripheral interface connectors on the board rear panel

- 3 x Audio jacks
- 2 x Ethernet connectors
- 1 x Parallel port connector
- 2 x PS/2 connectors
- 1 x Serial port connector
- 4 x USB 2.0 port connectors
- 1 x VGA connector

The IMBA-9654 has the following on-board jumpers:

- Clear CMOS
- CF card setting
- Select RS-232/422/485 for COM2
- COM3/COM4 Pin 8 Select

1.2.3 Technical Specifications

IMBA-9654 technical specifications are listed in **Table 1-1**. See **Chapter 2** for details.

Specification	IMBA-9654
Form Factor	ATX
System CPU	LGA775 Intel® Core™ 2 Quad LGA775 Intel® Core™ 2 Duo LGA775 Intel® Pentium® D LGA775 Intel® Pentium® 4 LGA775 Intel® Celeron® D
Front Side Bus	533 MHz, 800 MHz or 1066 MHz
System Chipset	**Northbridge**: Intel® Q965 **Southbridge**: Intel® ICH8DO
Memory	Four dual channel 240-pin DDR2 DIMM sockets support four 533 MHz, 667 MHz or 800 MHz 2.0 GB (max.) DIMM. A maximum of 8.0 GB DDR2 is supported.
Display	VGA integrated into the Intel® Q965
BIOS	AMI Flash BIOS
Audio	7.1 channel HD audio kit with Realtek ALC883 and dual audio streams supported
TPM	One 20-pin connector TPM v1.2 module
Expansion Options	One PCIe x16 slot One PCIe x4 slots Five PCI slots
Infrared (IrDA)	One IrDA by pin header

LAN	Dual Broadcom BCM5787M PCIe GbE chipsets with ASF 2.0 support
SuperIO	ITE IT8712F
SSD	CF Type II
Digital I/O	8-bit digital I/O, 4-bit input/4-bit output
COM	Five RS-232 serial ports (four internal, one external) One RS-232, RS-422 or RS-485 serial port (internal)
USB 2.0	Eight USB 2.0 devices supported
IDE	Two 40-pin IDE connector connects to two Ultra ATA33/66/100 devices
SATA	Six 3.0 Gbps SATA II drives supported
Keyboard/mouse	Two PS/2 connectors for keyboard and mouse
Parallel Port	One external parallel port connects to parallel communications device (e.g. printer)
Watchdog Timer	Software programmable 1-255 sec. by super I/O
Power Supply	ATX power only
Power Consumption	5 V @ 4.62 A, 12 V @ 9.71 A and 3.3 V @ 5.74z A (Intel® Pentium® 4 3.73GHz, 1066MHz FSB CPU and 1GB 667MHz DDR2)
Temperature	0ºC – 60ºC (32ºF - 140ºF)
Humidity (operating)	5%~95% non-condensing
Dimensions (LxW)	304.80 mm x 243.84 mm
Weight (GW/NW)	1350g/750g

Table 1-1: Technical Specifications

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Chapter

2

Detailed Specifications

2.1 Dimensions

2.1.1 Board Dimensions

The dimensions of the board are listed below:

- **Length**: 304.80mm
- **Width**: 243.84mm

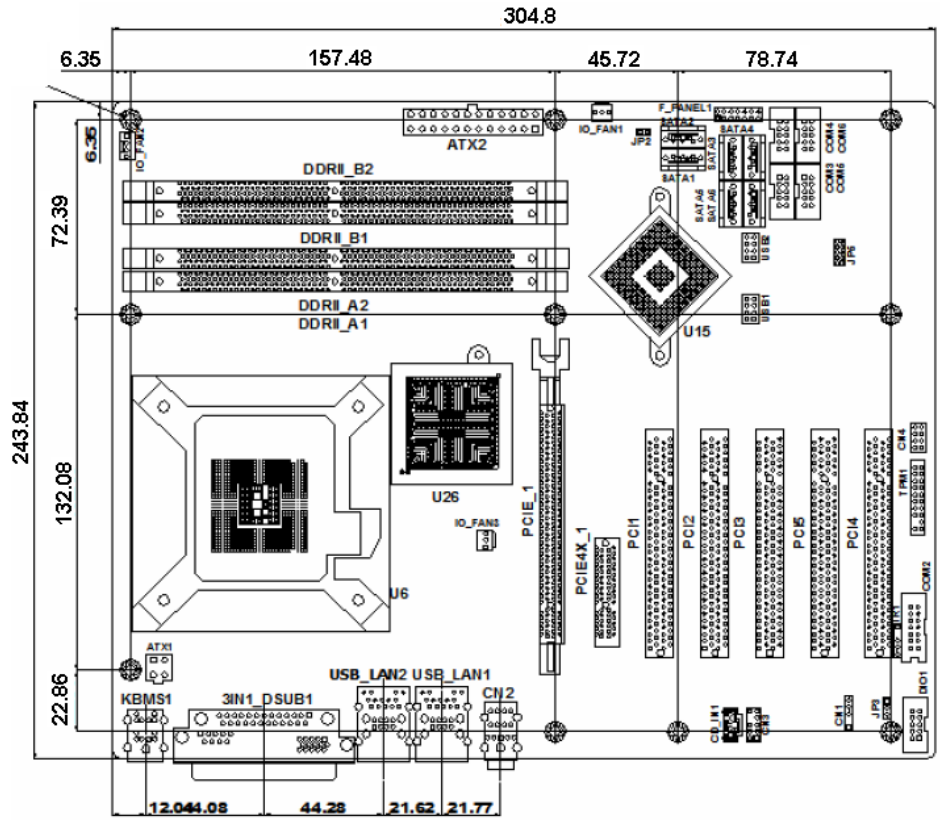


Figure 2-1: IMBA-9654 Dimensions (mm)

2.1.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 2-2**.

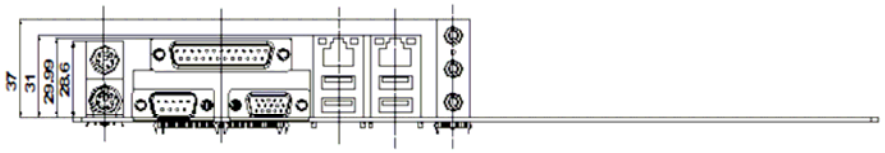


Figure 2-2: External Interface Panel Dimensions (mm)

2.2 Data Flow

Figure 2-3 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

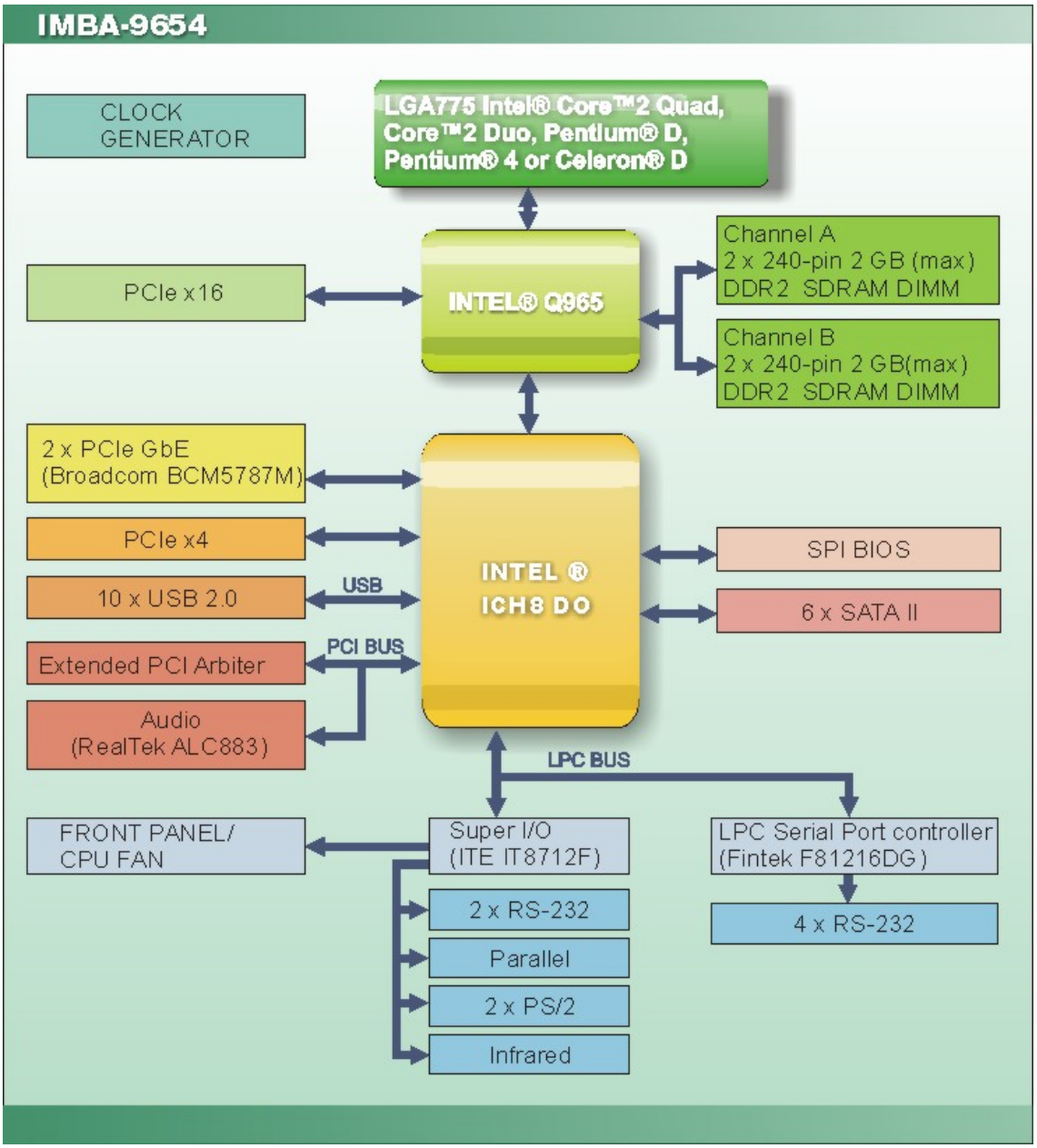


Figure 2-3: Data Flow Block Diagram

2.3 Compatible Processors

The IMBA-9654 supports the following LGA775 processors:

- Intel® Core™2 Quad
- Intel® Core™2 Duo
- Intel® Pentium® D
- Intel® Pentium® 4
- Intel® Celeron® D

All of the above processors are interfaced with an Intel® Q965 northbridge chipset through the front side bus (FSB). Features of the supported processors are listed in sections below.

2.3.1 Intel® Core™2 Quad Features

Intel® Core™2 Quad features include:

- Four processing cores
- Up to 8MB of shared L2 cache
- Up to 1066 MHz FSB
- Intel® Wide Dynamic Execution
- Intel® Intelligent Power Capability
- Intel® Smart Memory Access
- Intel® Advanced Smart Cache
- Intel® Advanced Digital Media Boost

2.3.2 Intel® Core™2 Duo Features

Intel® Core™2 Duo features include:

- Two processing cores
- Up to 8MB of shared L2 cache
- Up to 1066 MHz FSB
- Intel® Wide Dynamic Execution
- Intel® Intelligent Power Capability Intel® Smart Memory Access

- Intel® Advanced Smart Cache
- Intel® Advanced Digital Media Boost

2.3.3 Intel® Pentium® 4 Features

Intel® Pentium® 4 features include:

- Hyper-Threading Technology
- Enhanced Intel SpeedStep® Technology
- Intel® Extended Memory 64 Technology
- Execute Disable Bit

2.3.4 Intel® Pentium® D Features

Intel® Pentium® D features include:

- Dual core processing improves performance and multimedia management
- Intel® Visualization Technology
- Dual 2MB level 2 cache
- 800MHz FSB
- Execute Disable Bit
- Intel® Extended Memory 64 Technology
- Enhanced Intel SpeedStep® Technology
- Streaming SIMD solutions

2.3.5 Intel® Celeron® D Features

Intel® Celeron® D features include:

- Intel® Extended Memory 64 Technology
- 512KB Level 2 cache
- 533MHz FSB
- Execute Disable Bit
- Streaming SIMD solutions

2.4 Intel® Q965 Northbridge Chipset

2.4.1 Intel® Q965 Overview

The Intel® Q965 (G)MCH supports LGA775 processors. The (G)MCH supports a FSB frequency of 533 MHz, 800 MHz or 1066 MHz. Some of the features of the Intel® Q965 (G)MCH Include:

- Support for the following processors.
  - Intel® Core™2 Quad
  - Intel® Core™2 Duo
  - Intel® Pentium® D
  - Intel® Pentium® 4
  - Intel® Celeron® D
- Supports Hyper-Threading Technology (HT Technology)
- Supports FSB Dynamic Bus Inversion (DBI)
- Supports 36-bit host bus addressing, allowing the processor to access the entire
- 64 GB of the (G)MCH's memory address space
- Has a 12-deep In-Order Queue to support up to twelve outstanding pipelined address requests on the host bus
- Has a 1-deep Defer Queue
- Uses GTL+ bus driver with integrated GTL termination resistors
- Supports a Cache Line Size of 64 bytes

2.4.2 Intel® Q965 Memory Support

WARNING:

Only DDR2 memory module can be installed on the IMBA-9654. Do not install DDR memory modules. If a DDR memory module is installed on the IMBA-9654, the IMBA-9654 may be irreparably damaged.

The Intel® Q965 supports up to four 2GB DDR2 DIMMs with the following specifications:

- Only un-buffered DIMMs supported
- DDR2 only
- Maximum supported bandwidth (assuming DDR2 800 MHz):
  - ***Single-channel***: 6.4 GB/s
  - ***Dual-channel asymmetric mode***: 6.4 GB/s
  - ***Dual-channel interleaved mode***: 12.8 GB/s
- Capacities of 256MB, 512MB, 1GB or 2GB
- Transfer speeds of 533MHz, 667MHz or 800MHz

The memory sockets are shown in Figure 2-4.

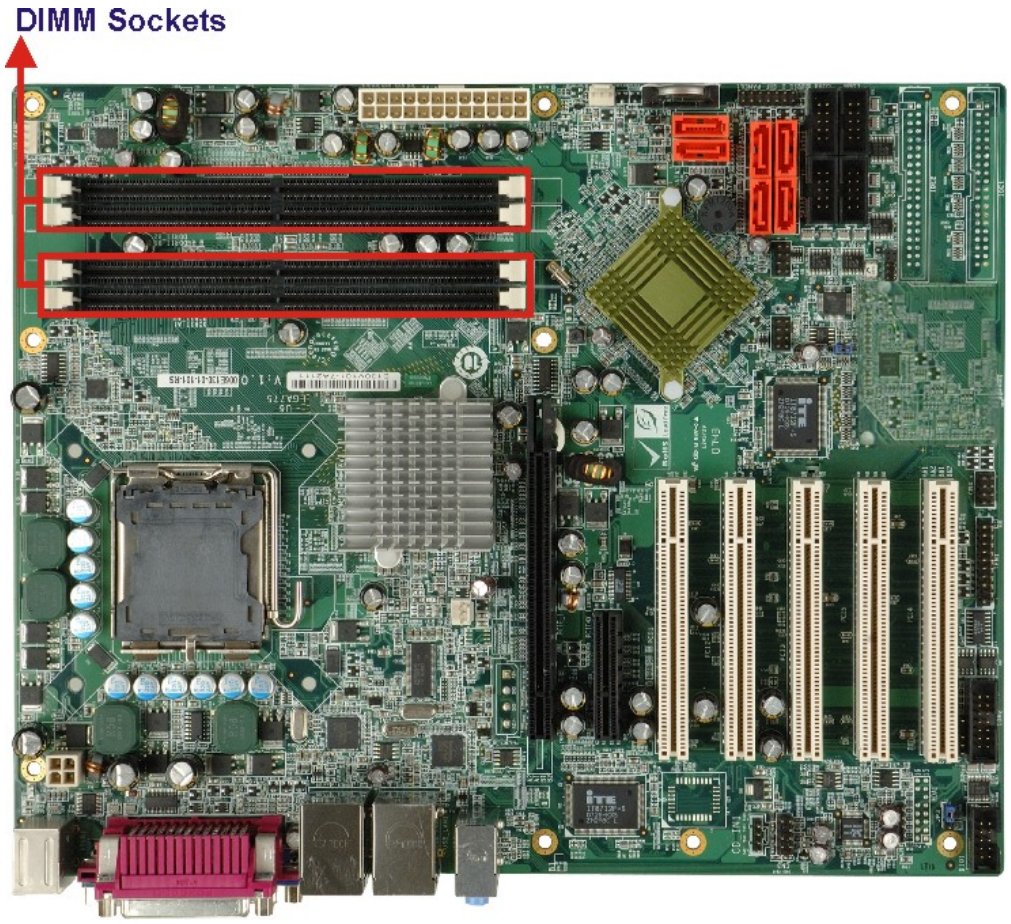


Figure 2-4: 240-pin DIMM Sockets

2.4.2.1 Intel® Q965 Analog CRT Support

A DB-15 VGA connector on the external peripheral interface connector panel is interfaced to the Intel® Q965 graphics engine. The Intel® Q965 internal graphics engine, with an 400MHz integrated 24-bit RAMDAC. Some of the graphics features are listed below.

- Analog Display Support
- 400 MHz Integrated 24-bit RAMDAC
- Up to 2048x1536 @ 75 Hz refresh
- Hardware Color Cursor Support
- DDC2B Compliant Interface

2.4.3 Intel® Q965 PCIe x16

2.4.3.1 PCIe x16 Bus Overview

The Intel® Q965 northbridge has one 16-lane PCIe port that is intended for an external PCIe graphics card. The PCIe x16 graphics card is installed on the PCIe x16 slot (**Figure 2-5)** and interfaced to the northbridge directly.

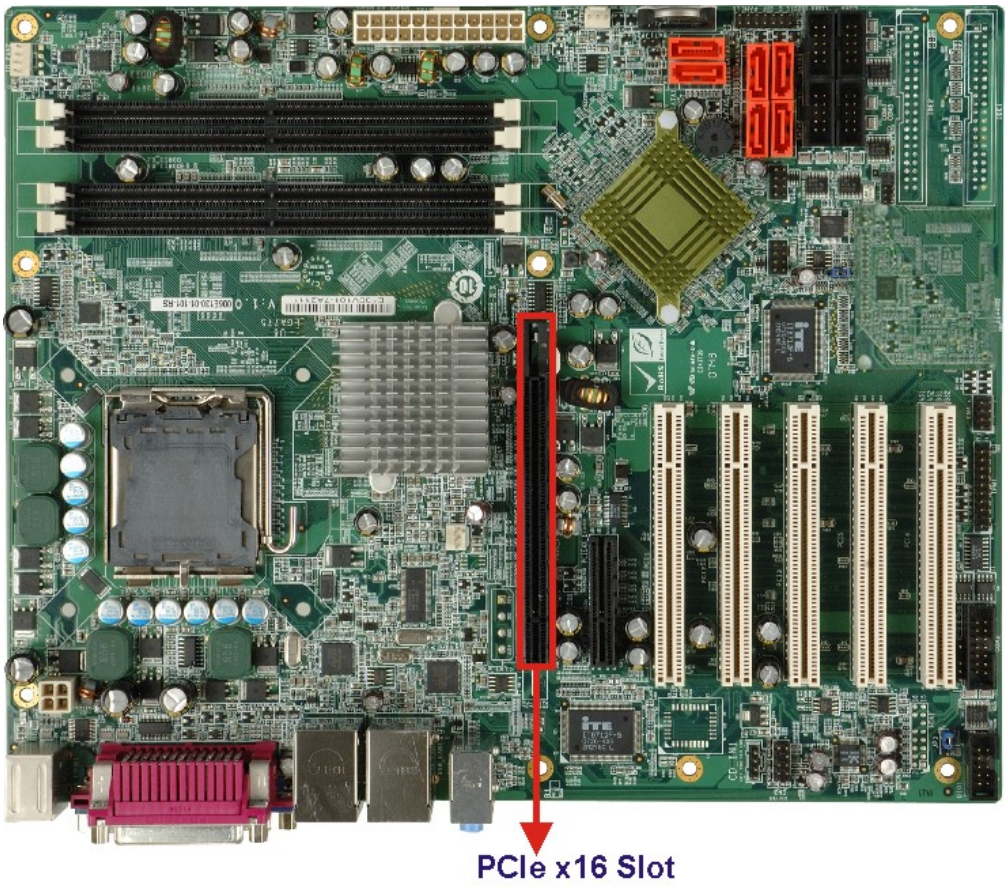


Figure 2-5: PCIe x16 Expansion Slot

2.4.3.2 PCIe x16 Bus Specifications

The PCIe port is compliant with the *PCI Express* Base Specification* revision 1.1. The PCIe x16 port operates at a frequency of 2.5 Gb/s on each lane while employing 8b/10b encoding; the port supports a maximum theoretical bandwidth of 40 Gb/s in each direction. Some of the features are listed below.

- One, 16-lane PCIe port intended for graphics attach, compatible to the PCI Express* Base Specification revision 1.1a.
- PCI Express frequency of 1.25 GHz resulting in 2.5 Gb/s each direction
- Raw bit-rate on the data pins of 2.5 Gb/s results in a real bandwidth per pair of 250 MB/s given the 8b/10b encoding used to transmit data across this interface
- Maximum theoretical realized bandwidth on the interface of 4 GB/s in each

direction simultaneously, for an aggregate of 8 GB/s when x16.

- PCI Express* Graphics Extended Configuration Space. The first 256 bytes of configuration space alias directly to the PCI Compatibility configuration space. The remaining portion of the fixed 4-KB block of memory-mapped space above that (starting at 100h) is known as extended configuration space.
- PCI Express Enhanced Addressing Mechanism. Accessing the device configuration pace in a flat memory mapped fashion.
- Automatic discovery, negotiation, and training of link out of reset
- Supports traditional PCI style traffic (asynchronous snooped, PCI ordering)
- Supports traditional AGP style traffic (asynchronous non-snooped, PCI Express relaxed ordering)
- Hierarchical PCI-compliant configuration mechanism for downstream devices (i.e., normal PCI 2.3 Configuration space as a PCI-to-PCI bridge)
- Supports “static” lane numbering reversal. This method of lane reversal is controlled by a Hardware Reset strap, and reverses both the receivers and transmitters for all lanes (e.g., TX[15]->TX[0], RX[15]->RX[0]). This method is transparent to all external devices and is different than lane reversal as defined in the PCI Express Specification. In particular, link initialization is not affected by static lane reversal.

2.4.4 Intel® Q965 Direct Media Interface (DMI)

Intel® Q965 northbridge GMCH is connected to the Intel® ICH8DO Southbridge Chipset through the chip-to-chip Direct Media Interface (DMI). Features of the Intel® Q965 DMI are listed below:

- chip-to-chip connection interface to Intel ICH8
- 2GB/s (1GB/s in each direction) bus speed
- 32-bit downstream address
- 100 MHz reference clock (shared with PCI Express Graphics Attach)
- APIC and MSI interrupt messaging support
- Message Signaled Interrupt (MSI) messages
- SMI, SCI and SERR error indication
- DMA, floppy drive, and LPC bus master

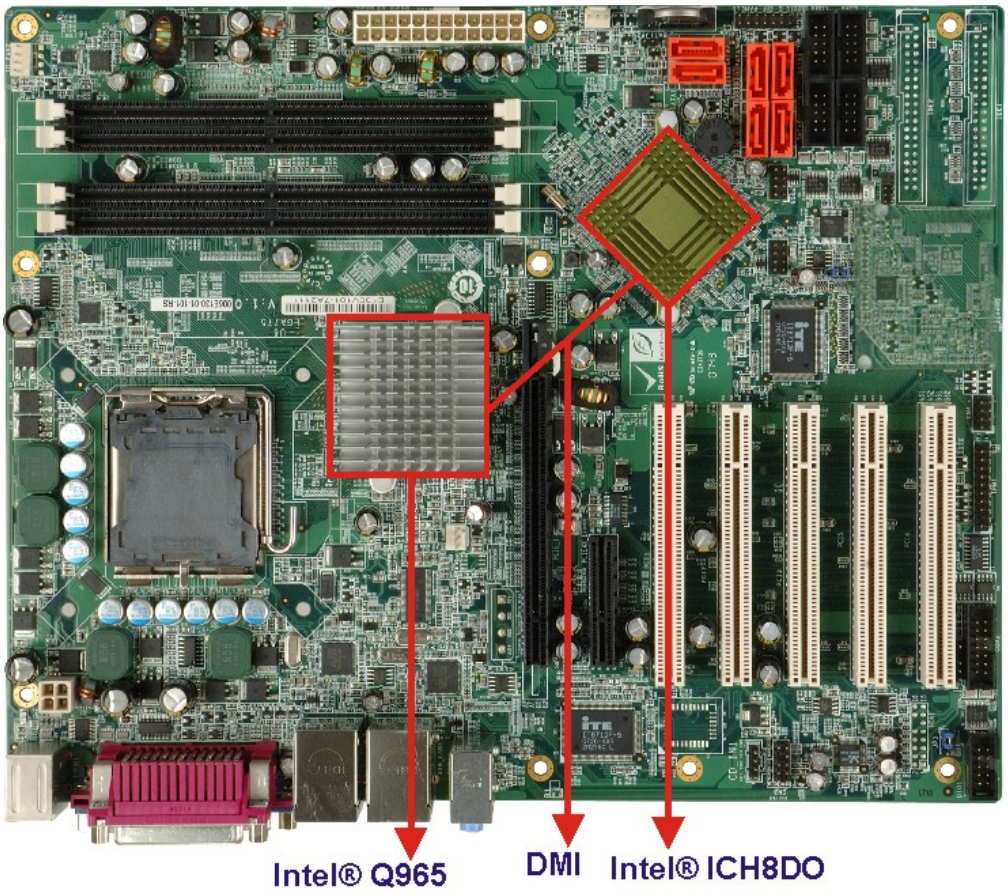


Figure 2-6: DMI Interface

2.5 Intel® ICH8DO Southbridge Chipset

2.5.1 Intel® ICH8DO Overview

The Intel® ICH8DO southbridge chipset is connected to the Intel® Q965 northbridge GMCH through the chip-to-chip Direct Media Interface (DMI). Some of the features of the Intel® ICH8DO are listed below.

- Complies with PCI Express Base Specification, Revision 1.1
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
  - Enhanced DMA controller

- Interrupt controller
- Timer functions

- Integrated SATA host controller with DMA operations and AHCI support interfaced to six SATA connectors on the IMBA-9654
- Supports the eight USB 2.0 devices on the IMBA-9654 with five UHCI controllers and two EHCI controllers
- Integrated 10/100/1000 GbE MAC with System Defense
- Complies with System Management Bus (SMBus) Specification, Version 2.0
- Supports Intel High Definition Audio
- Supports Intel® Matrix Storage Technology
- Supports Intel® Active Management Technology (ICH8DO only)
- Low Pin Count (LPC) interface
- Firmware Hub (FWH) interface support
- Serial Peripheral Interface (SPI) support

2.5.2 SPI BIOS Chipset:

A licensed copy of AMI BIOS installed is an onboard SPI (Serial Peripheral Interface) BIOS chipset. Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support

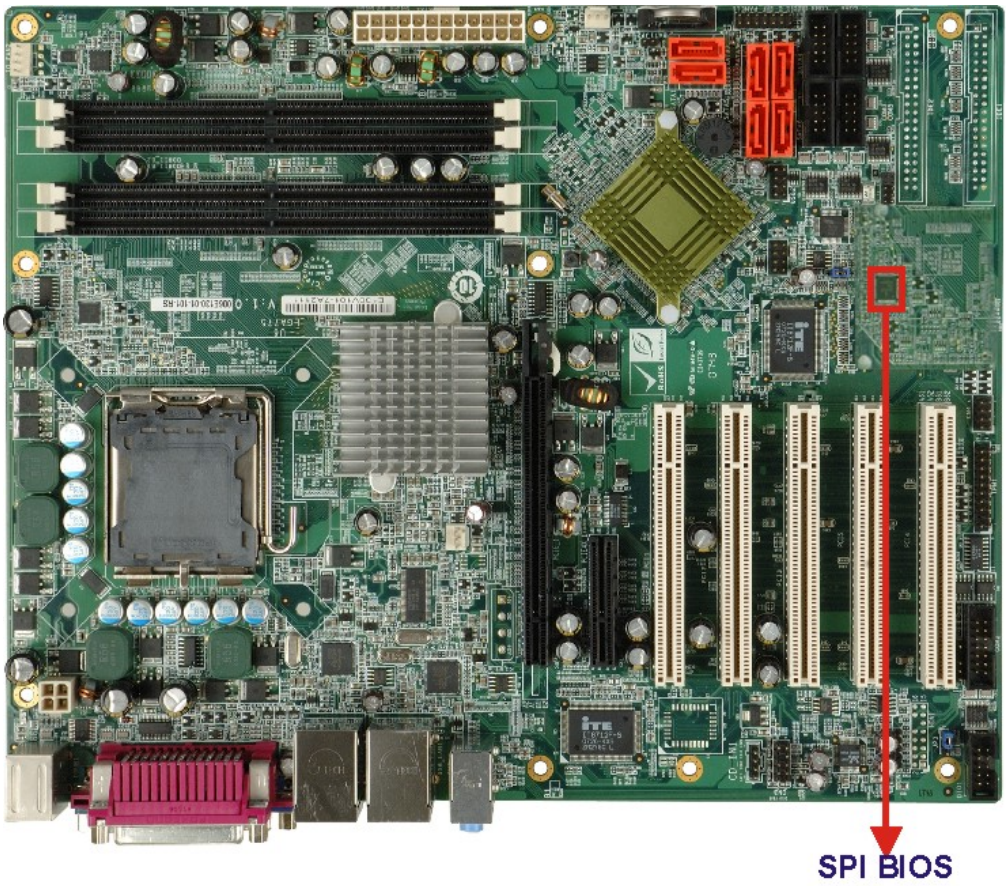


Figure 2-7: SPI BIOS Chipset

2.5.3 Intel® High Definition Audio

The IMBA-9654 onboard audio connector can connect to an optional audio kit. The codec on the optional audio kit is connected to the ICH8DO controller through the Intel® High Definition Audio serial link. The DMA engines in the controller move samples of digitally encoded data between system memory and the audio kit codec.

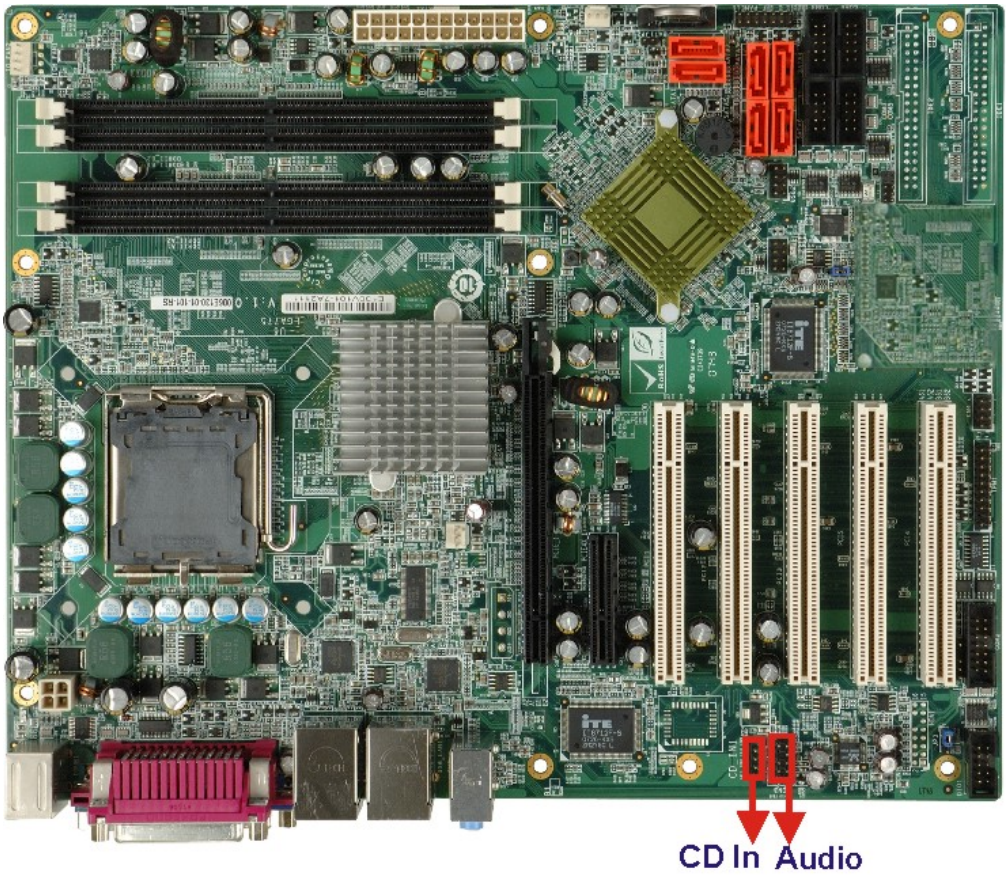


Figure 2-8: Audio Connectors

2.5.4 Intel® ICH8DO Low Pin Count (LPC) Interface

The ICH8DO LPC interface complies with the LPC 1.1 specifications. The LPC bus from the ICH8DO is connected to the following components:

- BIOS chipset
- Super I/O chipset

2.5.5 Intel® ICH8DO PCI Interface

The PCI interface on the ICH8DO is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI Revision 2.3 compliant
- 33MHz

- 5V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to seven PCI bus masters

Five PCI channels are connected to five PCI expansion sockets.

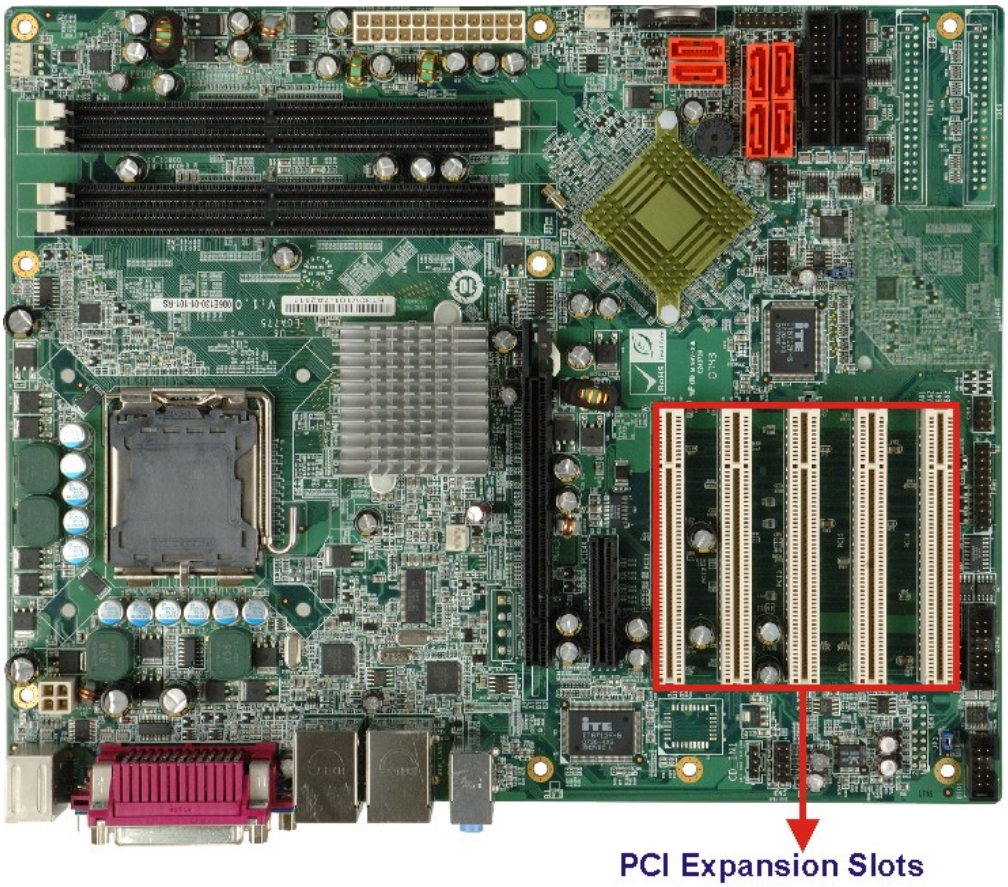


Figure 2-9: PCI Expansion Slots

2.5.6 Intel® ICH8DO PCIe Ports

There are six root PCIe ports on the Intel® ICH8DO. Port 5 and port 6 provides PCIe x1 connectivity to two Broadcom PCIe GbE controllers. Port 1 to port 4 are connected to a PCIe x4 expansion slot.

2.5.7 Intel® ICH8DO Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818A real time clock (RTC) integrated into the ICH8DO. The RTC operates on a 3V battery and 32.768KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

2.5.8 Intel® ICH8DO SATA Controller

The two integrated SATA controllers on the ICH8DO southbridge support six SATA II drives on the IMBA-9654 with independent DMA operations. The SATA controller contains two modes of operation – a legacy mode using I/O space, and an AHCI mode using memory space. SATA controller specifications are listed below.

- Supports independent DMA operation on up to six ports
- Supports six SATA drives
- Supports 3Gb/s data transfer speeds
- Supports Serial ATA 1.0 Specification, Revision 1.0

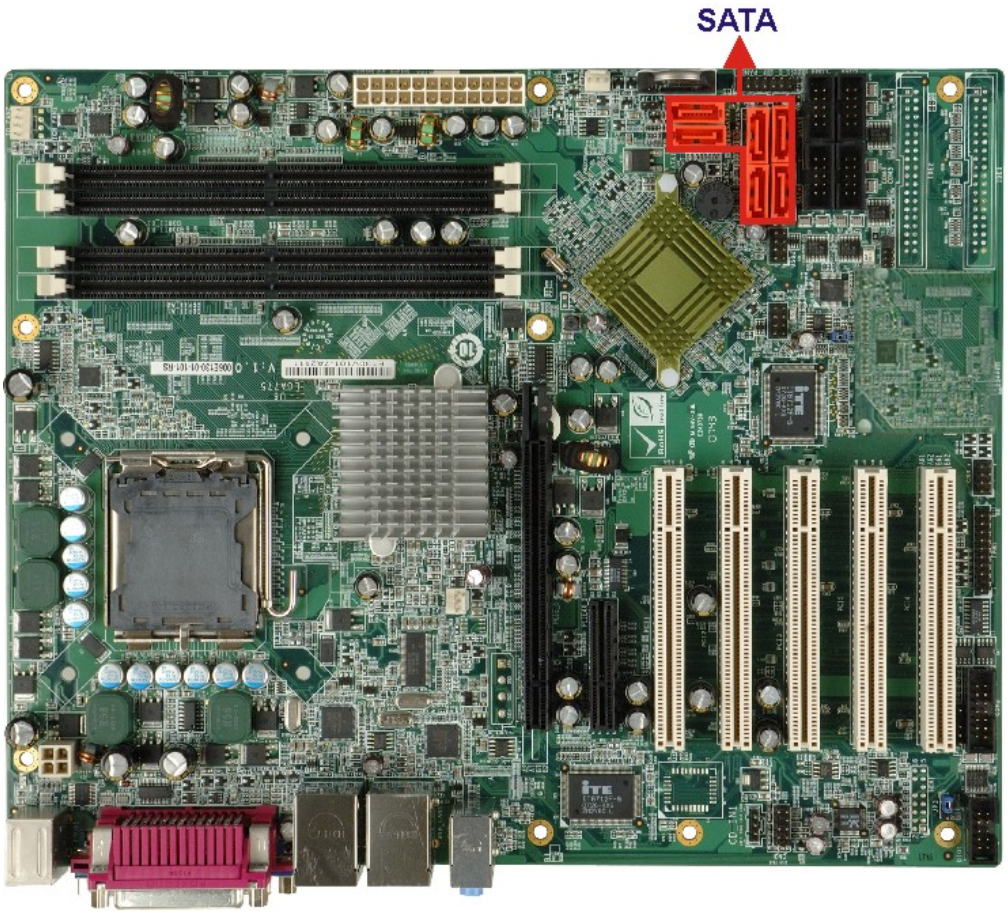


Figure 2-10: SATA Connectors

2.5.9 Intel® ICH8DO USB Controller

Up to eight high-speed, full-speed or low-speed USB devices are supported by the ICH8DO on the IMBA-9654. High-speed USB 2.0, with data transfers of up to 480MB/s, is enabled with the ICH8DO integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the ICH8DO integrated Universal Host Controller Interface (UHCI) controllers.

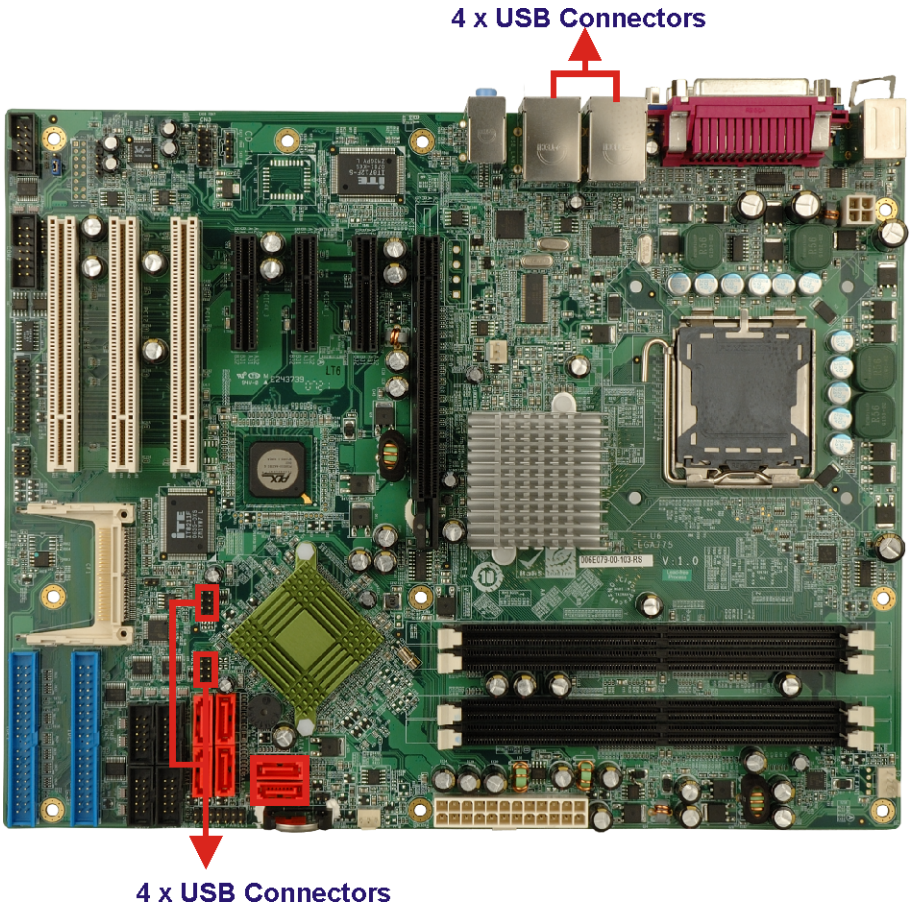


Figure 2-11: USB Connector

2.6 Intel® ICH8DO PCIe Bus Components

2.6.1 PCIe Bus Overview

The IMBA-9654 Intel® ICH8DO southbridge PCIe bus is split into two PCIe x1 channels and one PCIe x4 channel. The two PCIe x1 channels are each connected to a Broadcom PCIe GbE controller. The PCIe x4 channel is connected to a PCIe x4 slot.

2.6.2 PCIe x4 Expansion

Four of the PCI express root ports are connected to a single PCIe x4 expansion slot enabling PCIe x4 cards to be installed on the system.

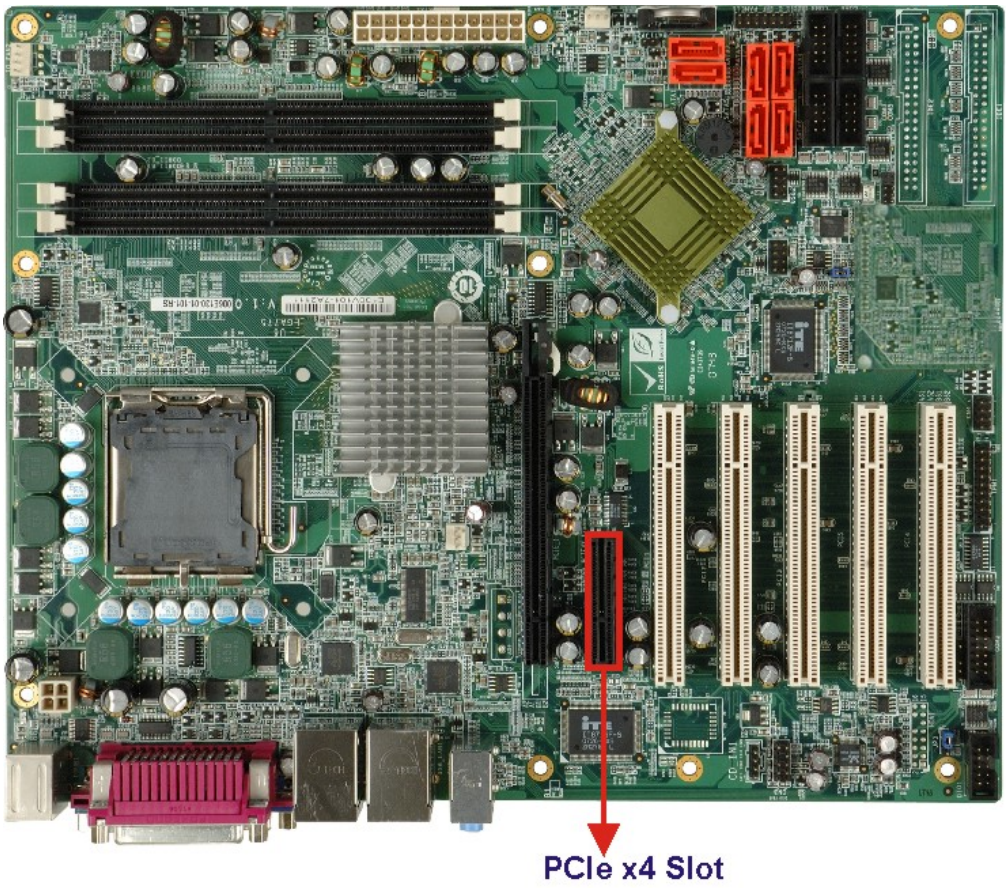


Figure 2-12: PCIe x4 Expansion Slot

2.6.3 PCIe GbE Ethernet

Two PCIe x1 lanes from the are connected to two Broadcom BCM5787M PCIe GbE controllers shown in **Figure 2-13** below.

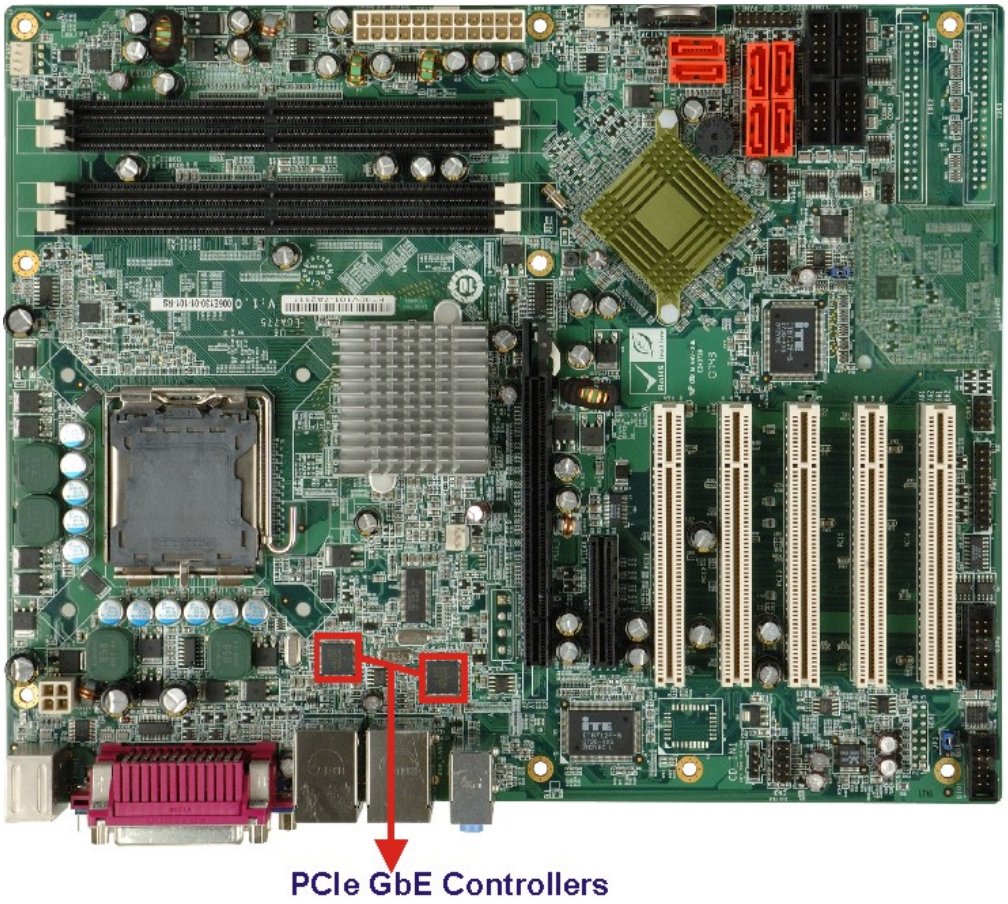


Figure 2-13: Broadcom PCI GbE Controllers

The Broadcom BCM5787M is a 10/100/1000BASE-T Ethernet LAN controller. The BCM5787M combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, a PCIe bus interface, and an on-chip buffer memory. Some of the BCM5787 controller features are listed below:

- Integrated 10/100/1000BASE-T transceiver
- Automatic MDI crossover function
- PCIe v1.0a
- 10/100/1000BASE-T full/half-duplex MAC
- Wake on LAN support meeting the ACPI requirements
- Statistics for SNMP MIB II, Ethernet-like MIB, and Ethernet MIB (802.3z, clause 30)
- Serial EEPROM or serial flash support

2.7 LPC Bus Components

2.7.1 LPC Bus Overview

The LPC bus is connected to components listed below:

- Super I/O chipset
- Serial port chipset
-

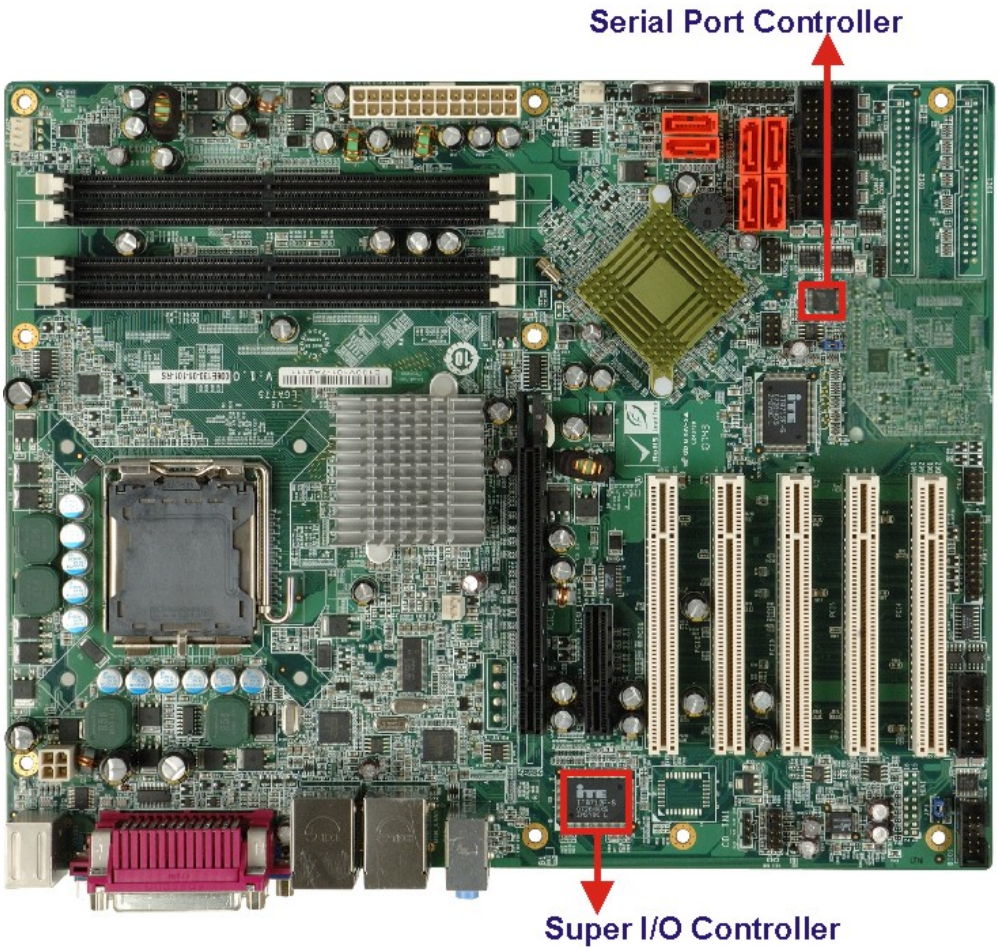


Figure 2-14: LPC Bus Components

2.7.2 Super I/O chipset

The iTE IT8712F Super I/O chipset is connected to the ICH8DO southbridge through the LPC bus. The iTE IT8712F is an LPC interface-based Super I/O device that comes with

Environment Controller integration. Some of the features of the iTE IT8712F chipset are listed below:

- PC98/99/2001, ACPI and LANDesk Compliant
- Enhanced Hardware Monitor
- Fan Speed Controller
- Single +5V Power Supply
- Two 16C550 UARTs for serial port control
- One IEEE 1284 Parallel Port
- Keyboard Controller
- Watchdog Timer
- Serial IRQ Support
- Vbat & Vcch Support
- Single +5V Power Supply

Some of the Super I/O features are described in more detail below:

2.7.2.1 Super I/O LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.0. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.7.2.2 Super I/O 16C550 UARTs

The onboard Super I/O has two integrated 16C550 UARTs that can support the following:

- Two standard serial ports (COM1 and COM2)
- IrDa 1.0 and ASKIR protocols

Another two chipsets connected to the LPC bus provided connectivity to another two serial port connectors (COM3 and COM4).

2.7.2.3 Super I/O Enhanced Hardware Monitor

The Super I/O Enhanced Hardware Monitor monitors three thermal inputs, VBAT internally, and eight voltage monitor inputs. These hardware parameters are reported in the BIOS and can be read from the BIOS Hardware Health Configuration menu.

2.7.2.4 Super I/O Fan Speed Controller

The Super I/O fan speed controller enables the system to monitor the speed of the fan. One of the pins on the fan connector is reserved for fan speed detection and interfaced to the fan speed controller on the Super I/O. The fan speed is then reported in the BIOS.

2.7.2.5 Super I/O Keyboard Controller

The Super I/O keyboard controller can execute the 8042 instruction set. Some of the keyboard controller features are listed below:

- The 8042 instruction is compatible with a PS/2 keyboard and PS/2 mouse
- Gate A20 and Keyboard reset output
- Supports multiple keyboard power on events
- Supports mouse double-click and/or mouse move power on events

2.7.3 Serial Port Chipset

The IMBA-9654 has a Fintek F81216DG chipset onboard enables the addition of four additional UART serial ports (COM3, COM4, COM5 and COM6). UART includes 16-byte send/receive FIFO. The Fintek serial port chipset is interfaced to the southbridge chipset through the LPC bus. Some of the features of the Fintek chipset are listed below:

- Supports LPC interface
- Totally provides 4 UART (16550 asynchronous) ports
  - 3 x Pure UART
  - 1 x UART+IR
- One Watch dog timer with WDTOUT# signal
- One Frequency input 24/48MHz
- Powered by 3Vcc

2.8 Environmental and Power Specifications

2.8.1 System Monitoring

Three thermal inputs on the IMBA-9654 Super I/O Enhanced Hardware Monitor monitor the following temperatures:

- Temperature sensor 1
- Temperature sensor 2
- Temperature sensor 3

All three fan speeds are monitored and can be seen in the BIOS as:

- FAN1 Speed
- FAN2 Speed
- FAN3 Speed

Eight voltage inputs on the IMBA-9654 Super I/O Enhanced Hardware Monitor monitor the following volatages:

- Vcore
- Vcc
- +3.30V
- +5.00V
- +12.0V
- +1.2V
- +1.5V
- +1.25V
- VBAT

The IMBA-9654 Super I/O Enhanced Hardware Monitor also monitors the following voltages internally:

- VBAT

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

2.8.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the IMBA-9654 are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the northbridge and southbridge chipsets to ensure the operating temperature of these chips remain low.

2.8.3 Power Consumption

Table 2-1 shows the power consumption parameters for the IMBA-9654 running with a 1066 MHz FSB 3.73 GHz Intel® Pentium® 4 processor with 1 GB of 667 MHz DDR2 memory.

Voltage	Current
+3.3 V	5.74 A
+5 V	4.62 A
+12 V	9.71 A

Table 2-1: Power Consumption

Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IMBA-9654 may result in permanent damage to the IMBA-9654 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-9654. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-9654, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the IMBA-9654, place it on an antic-static pad. This reduces the possibility of ESD damaging the IMBA-9654.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold the PCB by the edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the IMBA-9654 is unpacked, please do the following:

- Follow the anti-static precautions outlined in Section 3.1.
- Make sure the packing box is facing upwards so the IMBA-9654 does not fall out of the box.
- Make sure all the components shown in Section 3.3 are present.

3.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IMBA-9654 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

3.3.1 Package Contents

The IMBA-9654 is shipped with the following components:

Quantity	Item and Part Number	Image
1	IMBA-9654	
2	Dual RS-232 cable (**P/N**: 32200-004101-RS)	
1	Single RS-232 cable (**P/N**: 32200-029400-RS)	
1	I/O Shielding (**P/N**: 45002-450903-00-RS)	
6	SATA cables (**P/N**: 32000-062800-RS)	

3	SATA power cables (**P/N**: 32100-088600-RS)	
1	Mini jumper Pack	
1	Quick Installation Guide	
1	Utility CD	

Table 3-1: Package List Contents

3.4 Optional Items

2-port USB cable (w bracket) (**P/N**:CB-USB02-RS)	
4-port USB cable (**P/N**: CB-USB14-RS)	
CPU cooling kit (**P/N**: CF-520-RS)	
CPU cooling kit (**P/N**: CF-775A-RS)	
Dual RS-232/422/485 cable (**P/N**: 32200-000063-RS)	
PCIe x16 VGA output SDVO card with dual display support (**P/N**: SDVO-100VGA-R10)	

PCIe x16 DVI output SDVO card with dual display support (**P/N**: SDVO-100DVI-R10)	
Infineon TPM module (**P/N**: TPM-IN01-R10)	
Sinosun TPM module (**P/N**: TPM-SI01-R10)	
Winbond TPM module (**P/N**: TPM-WI01-R10)	

Table 3-2: Package List Contents

Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 4.1.2 shows peripheral interface connector locations. Section 4.1.2 lists all the peripheral interface connectors seen in Section 4.1.2.

4.1.1 IMBA-9654 Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

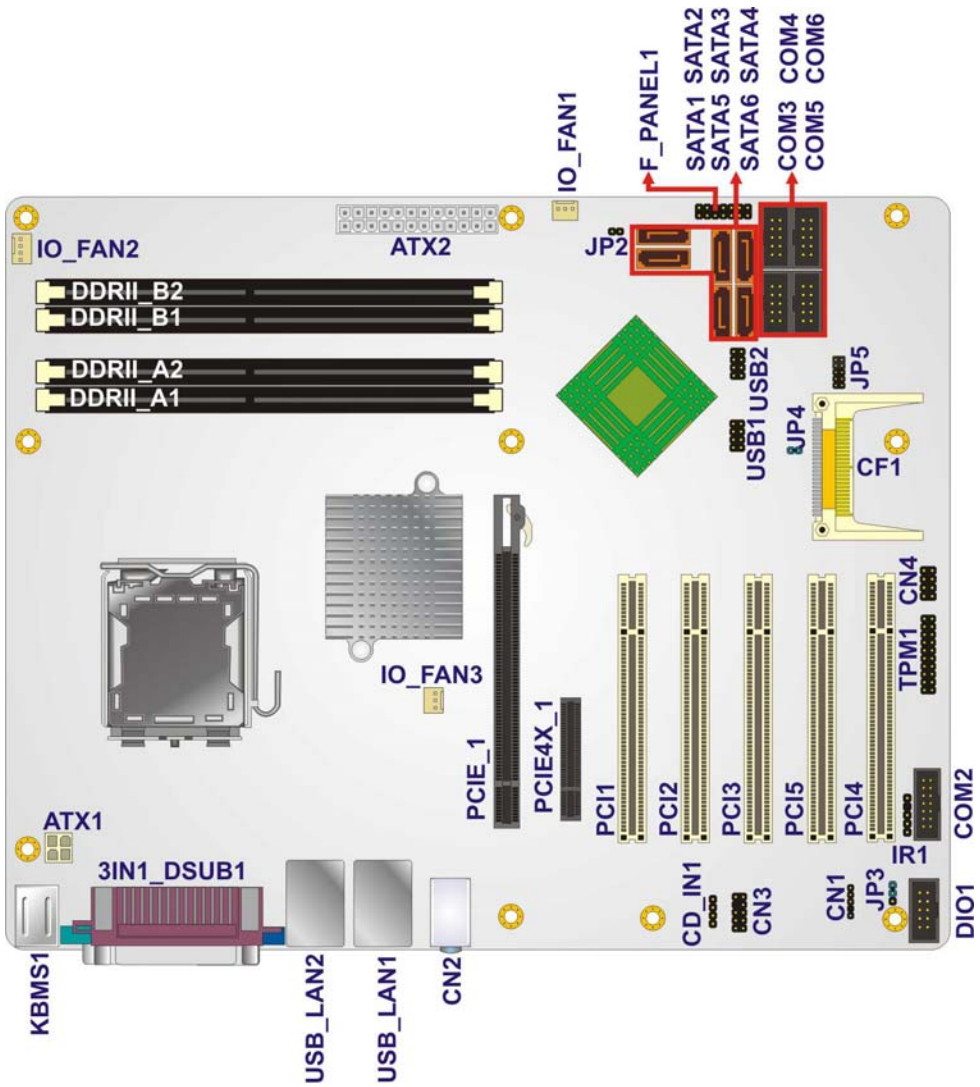


Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the IMBA-9654. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX +12V power connector	4-pin ATX	ATX1
ATX power connector	24-pin ATX	ATX2
Audio CD In	4-pin header	CD_IN1
Audio connector	10-pin header	CN3
Cooling fan connector, CPU	4-pin wafer	IO_FAN2
Cooling fan connector, system	3-pin wafer	IO_FAN1
Cooling fan connector, system	3-pin wafer	IO_FAN3
Digital input/output connector	10-pin header	DIO1
Front panel connector	14-pin header	F_PANEL1
Infrared (IrDA) connector	5-pin header	IR1
Serial ATA drive connector	7-pin SATA	SATA1
Serial ATA drive connector	7-pin SATA	SATA2
Serial ATA drive connector	7-pin SATA	SATA3
Serial ATA drive connector	7-pin SATA	SATA4
Serial ATA drive connector	7-pin SATA	SATA5
Serial ATA drive connector	7-pin SATA	SATA6
Serial port connector (COM2)	14-pin header	COM2
Serial port connector (COM3)	10-pin header	COM3
Serial port connector (COM4)	10-pin header	COM4

Serial port connector (COM5)	10-pin header	COM5
Serial port connector (COM6)	10-pin header	COM6
SPDIF connector	5-pin header	CN1
SPI connector	8-pin header	CN4
TPM connector	20-pin header	TPM1
USB connectors	8-pin header	USB1
USB connectors	8-pin header	USB2

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the IMBA-9654. Detailed descriptions of these connectors can be found in **Section 4.3** on **page 68**

Connector	Type	Label
Audio connector	3 x audio jacks	CN2
Keyboard and mouse connector	Dual PS/2	KBMS1
Parallel port connector	D-Sub 25-pin female	3IN1 DSUB1
Serial port connector (RS-232)	D-Sub 9-pin male	3IN1 DSUB1
Dual USB and LAN Combo	Dual USB ports and RJ-45	USB_LAN1
Dual USB and LAN Combo	Dual USB ports and RJ-45	USB_LAN2
VGA port connector	D-Sub 15-pin female	3IN1 DSUB1

Table 4-2: Rear Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the IMBA-9654.

4.2.1 ATX +12V Power Connector

CN Label: ATX1

CN Type: 4-pin ATX power connector (2x2)

CN Location: See **Figure 4-2**

CN Pinouts: See **Table 4-3**

The 4-pin ATX power connector is connected to an ATX power supply.

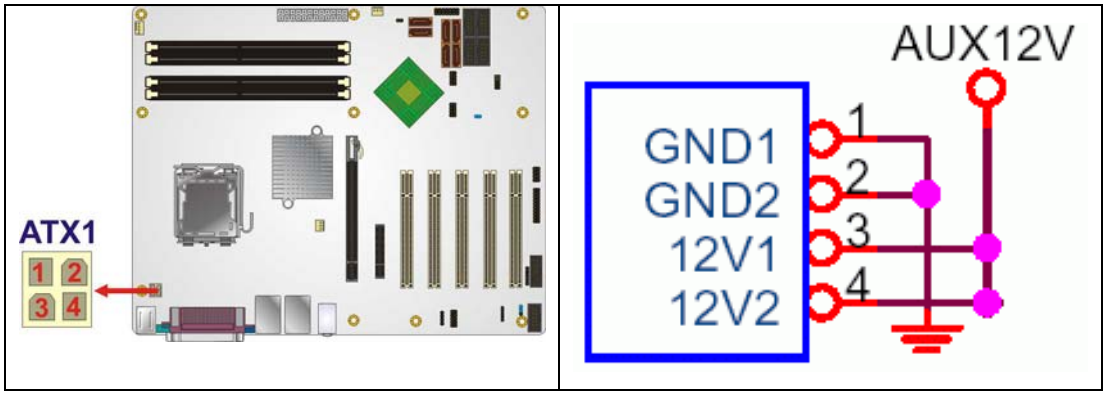


Figure 4-2: ATX Power Connector Location

PIN NO.	DESCRIPTION
1	GND
2	GND
3	+12V
4	+12V

Table 4-3: ATX Power Connector Pinouts

4.2.2 ATX Power Connector

CN Label: ATX2

CN Type: 24-pin ATX (2x12)

CN Location: See **Figure 4-3**

CN Pinouts: See **Table 4-4**

The ATX connector is connected to an external ATX power supply. Power is provided to the system, from the power supply through this connector.

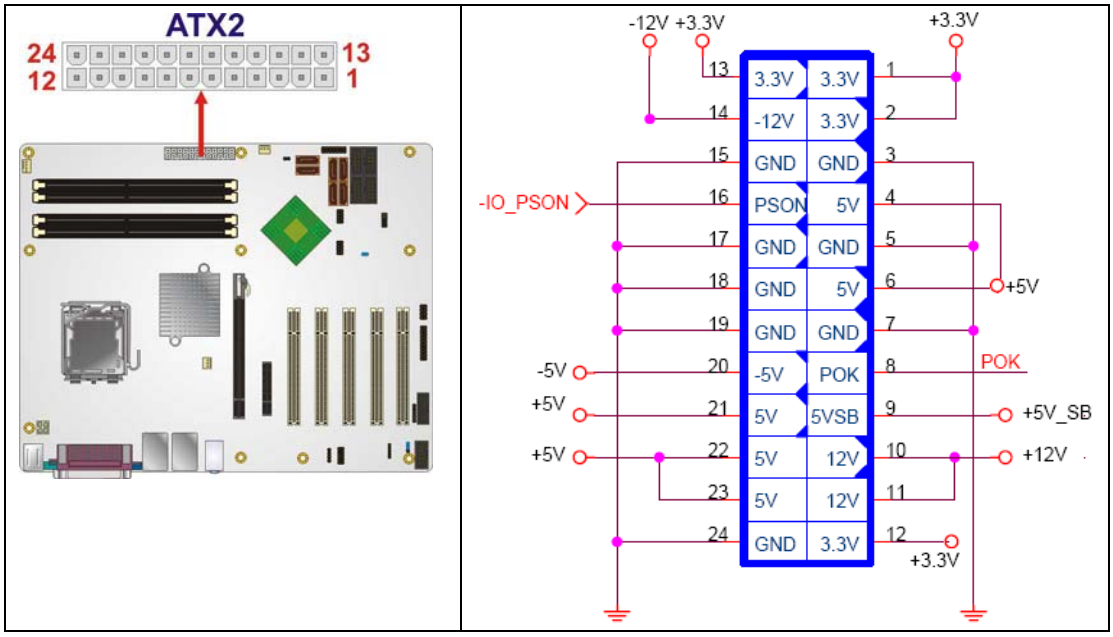


Figure 4-3: ATX Power Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GROUND	15	GROUND
4	+5V	16	PS-ON
5	GROUND	17	GROUND
6	+5V	18	GROUND

7	GROUND	19	GROUND
8	POWER GOOD	20	GND
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

Table 4-4: ATX Power Connector Pinouts

4.2.3 Audio CD In Connector (4-pin)

CN Label: **CD_IN1**

CN Type: 10-pin header

CN Location: See **Figure 4-4**

CN Pinouts: See **Table 4-5**

The 4-pin audio CD in connector is connected to an external audio CD device for the input and output of audio signals from a CD player to the system.

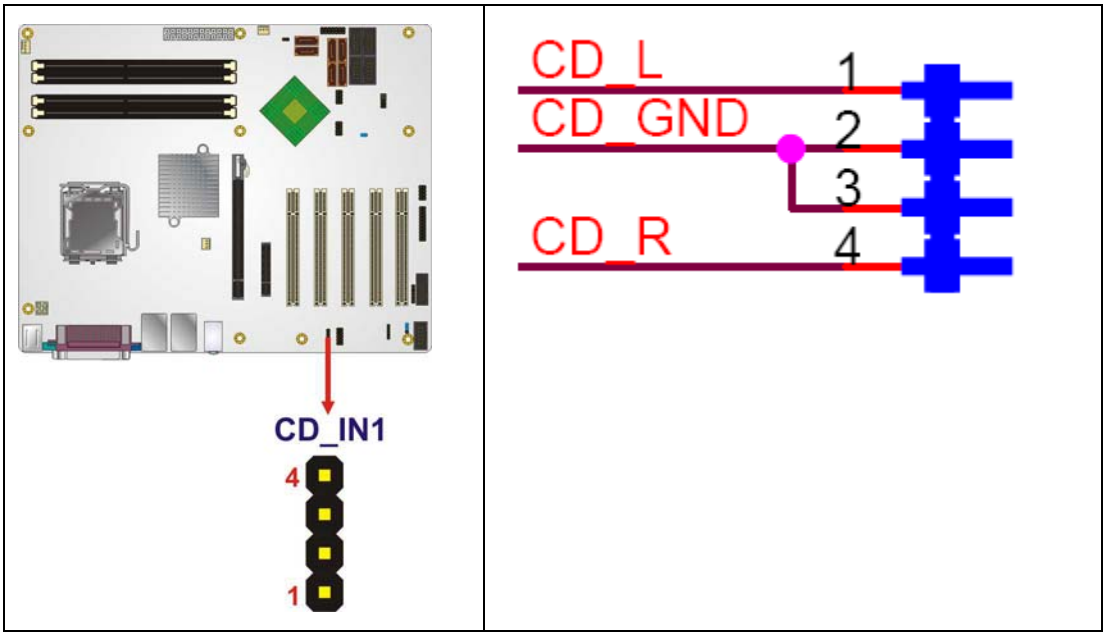


Figure 4-4: Audio CD In Connector Pinouts (4-pin)

PIN NO.	DESCRIPTION
1	CD Signal (Left)
2	Ground
3	Ground
4	CD Signal (Right)

Table 4-5: Audio CD In Connector Pinouts

4.2.4 Audio Connector

CN Label: CN3

CN Type: 10-pin header (2x5)

CN Location: See Figure 4-5

CN Pinouts: See Table 4-6

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

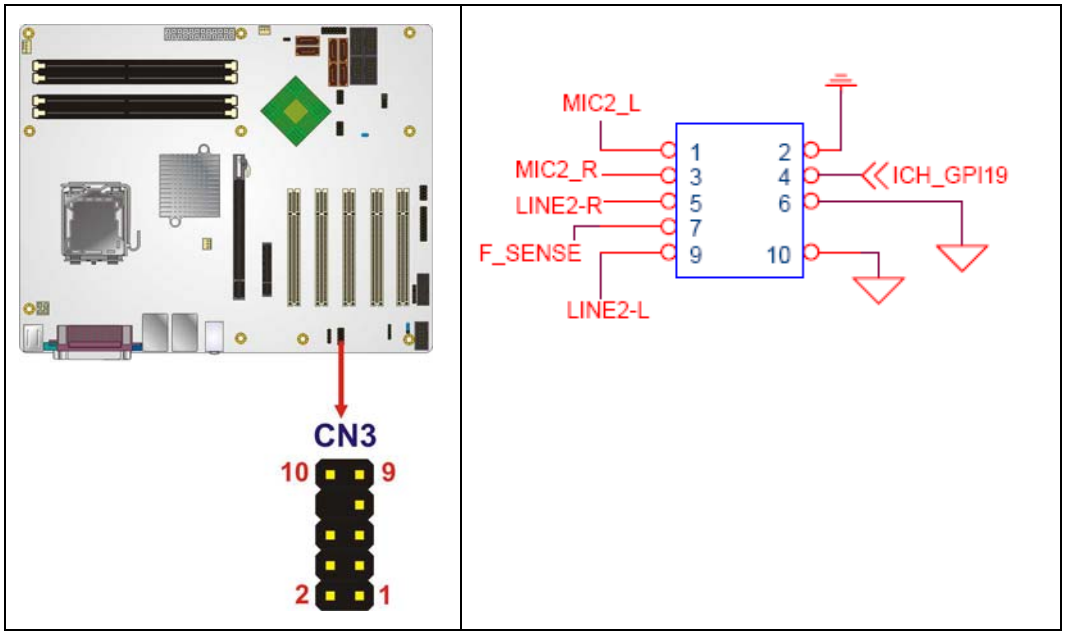


Figure 4-5: Audio Connector Location (10-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MIC-L	2	GND
3	MIC-R	4	+5V
5	LINE OUT-R	6	PULL DOWN
7	LINE OUT SENSE	8	KEY
9	LINE OUT-L	10	PULL DOWN

Table 4-6: Audio Connector Pinouts

4.2.5 Digital Input/Output (DIO) Connector

CN Label: DIO1

CN Type: 10-pin header (2x5)

CN Location: See Figure 4-6

CN Pinouts: See Table 4-7

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

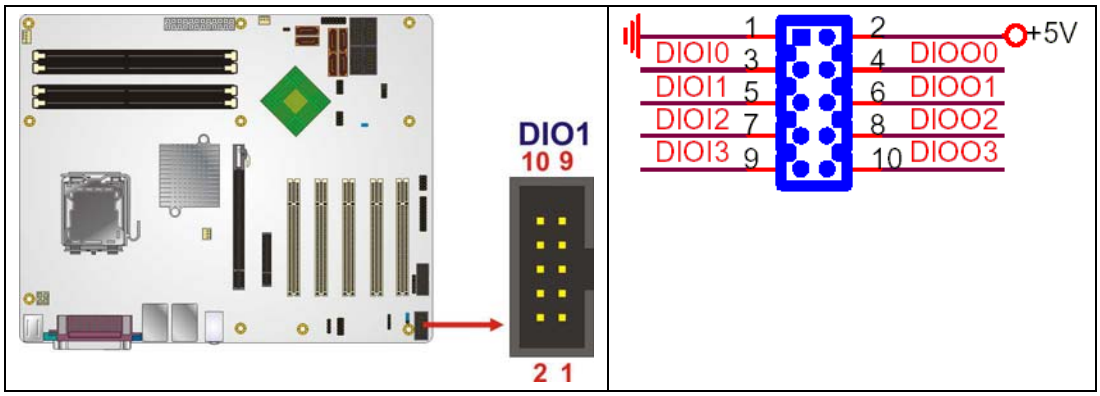


Figure 4-6: DIO Connector Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Ground	2	VCC
3	Input 0	4	Output 0

5	Input 1	6	Output 1
7	Input 2	8	Output 2
9	Input 3	10	Output 3

Table 4-7: DIO Connector Connector Pinouts

4.2.6 Fan Connector (+12V) (CPU Cooling Fan)

CN Label: IO_FAN2

CN Type: 4-pin wafer

CN Location: See Figure 4-7

CN Pinouts: See Table 4-8

The CPU cooling fan connector provides a 12V, 500mA current to a CPU cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

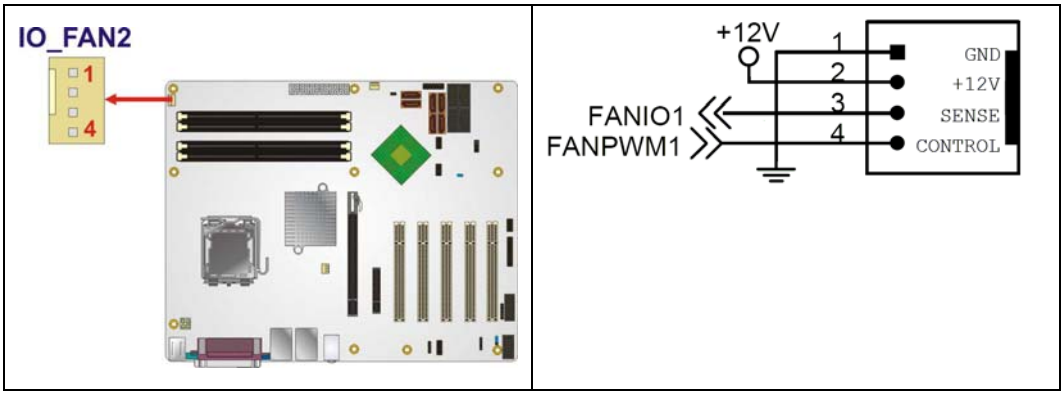


Figure 4-7: +12V Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	Rotation Signal
4	Control

Table 4-8: +12V Fan Connector Pinouts

4.2.7 Fan Connector (+12V) (System Cooling Fans)

CN Label: **IO_FAN1, IO_FAN3**

CN Type: 3-pin header

CN Location: See **Figure 4-7**

CN Pinouts: See **Table 4-8**

Two system cooling fan connectors provide a 12V, 500mA current to two system cooling fans. The connectors have a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

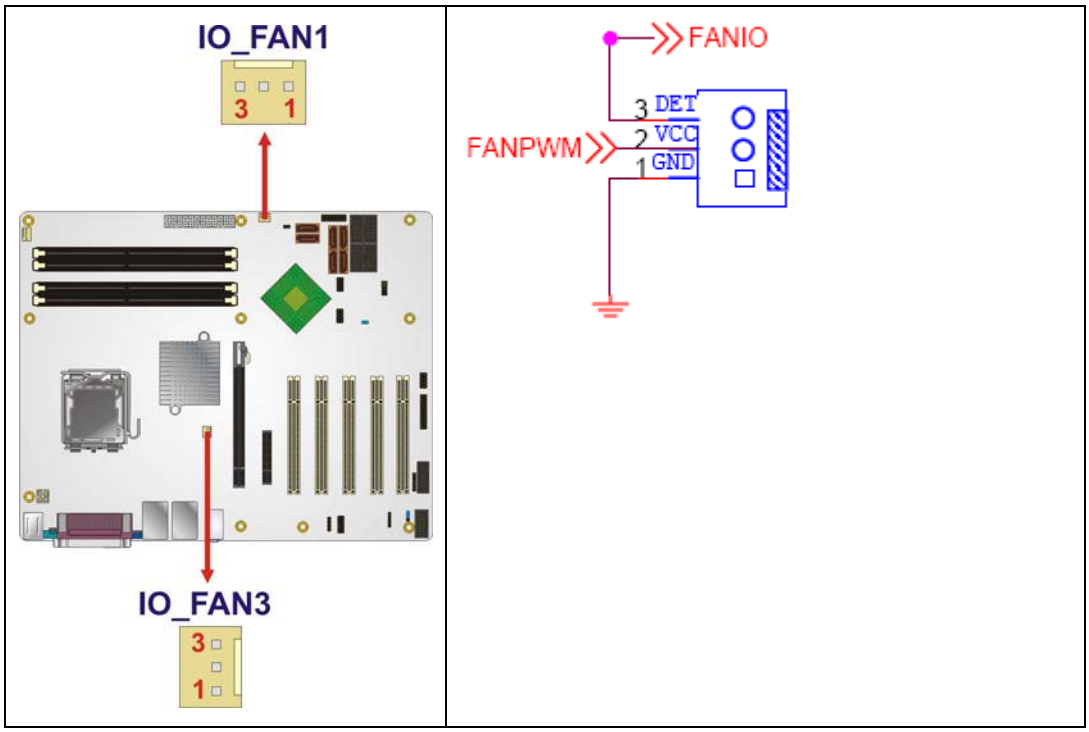


Figure 4-8: +12V Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	Fan Speed Detect

Table 4-9: +12V Fan Connector Pinouts

4.2.8 Front Panel Connector (14-pin)

CN Label: F_PANEL1

CN Type: 14-pin header (2x7)

CN Location: See Figure 4-9

CN Pinouts: See Table 4-10

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power LED
- Speaker
- Power button
- Reset
- HDD LED

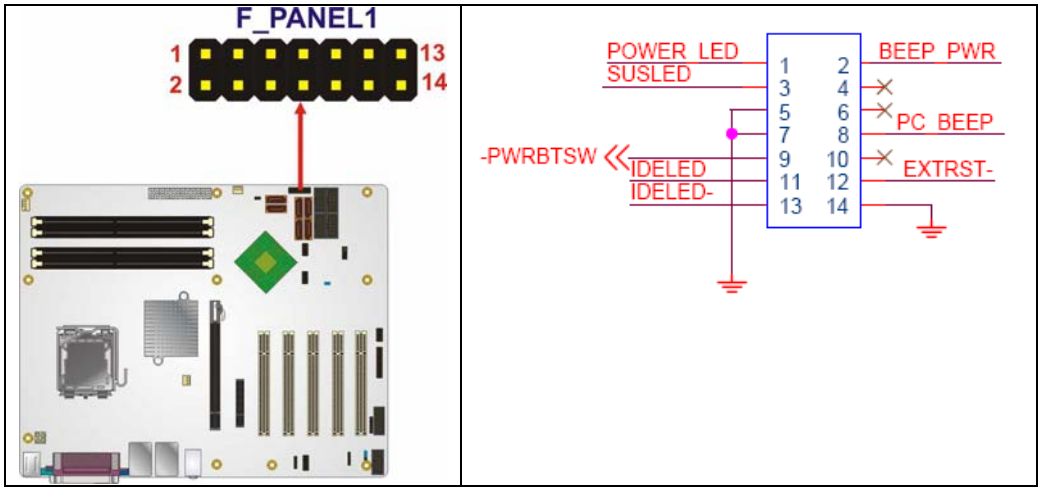


Figure 4-9: Front Panel Connector Pinout Locations (14-pin)

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	LED+	Buzzer	2	BUZZER-
	3	N/C		4	N/C
	5	GND		6	N/C
Power	7	PWRBTSW-		8	VCC
Button	9	PWRBTSW+	Reset	10	N/C
HDD LED	11	IDE_LED+		12	RESET-
	13	IDE_LED-		14	GND

Table 4-10: Front Panel Connector Pinouts (14-pin)

4.2.9 Infrared Interface Connector (5-pin)

CN Label: IR1

CN Type: 5-pin header (1x5)

CN Location: See Figure 4-10

CN Pinouts: See Table 4-11

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

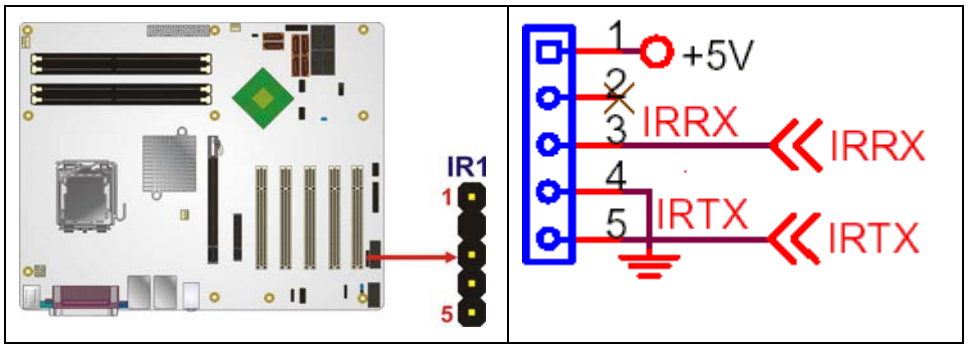


Figure 4-10: Infrared Connector Pinout Locations

PIN NO.	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 4-11: Infrared Connector Pinouts

4.2.10 PCI Slot

CN Label: **PCI1, PCI2, PCI3, PCI4, PCI5**

CN Type: PCI Slot

CN Location: See **Figure 4-11**

CN Pinouts: See **Table 4-12**

The PCI slot enables a PCI expansion module to be connected to the board.

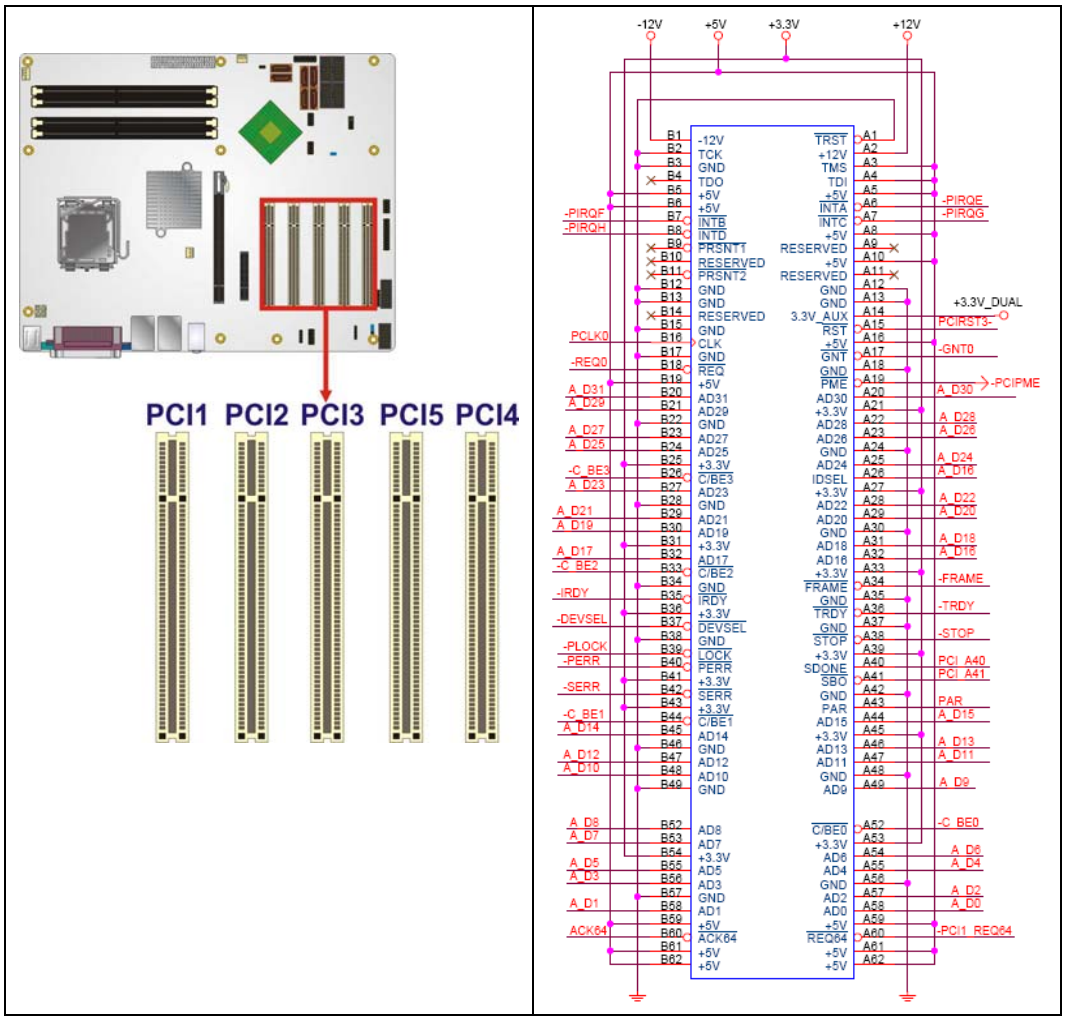


Figure 4-11: PCI Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	TRST	B1	-12V
A2	+12V	B2	TCK
A3	TMS	B3	GND
A4	TDI	B4	TDO
A5	+5V	B5	+5V
A6	INTA	B6	+5V
A7	INTC	B7	INTB
A8	+5V	B8	INTD
A9	RESERVED3	B9	PRSNT1

A10	+5V	B10	RESERVED1
A11	RESERVED4	B11	PRSNT2
A12	GND	B12	GND
A13	GND	B13	GND
A14	3.3V_AUX	B14	RESERVED2
A15	RST	B15	GND
A16	+5V	B16	CLK
A17	GNT	B17	GND
A18	GND	B18	REQ
A19	PME	B19	+5V
A20	AD30	B20	AD31
A21	+3.3V	B21	AD29
A22	AD28	B22	GND
A23	AD26	B23	AD27
A24	GND	B24	AD25
A25	AD24	B25	+3.3V
A26	IDSEL	B26	C/BE3
A27	+3.3V	B27	AD23
A28	AD22	B28	GND
A29	AD20	B29	AD21
A30	GND	B30	AD19
A31	AD18	B31	+3.3V
A32	AD16	B32	AD17
A33	+3.3V	B33	C/BE2
A34	FRAME	B34	GND
A35	GND	B35	IRDY
A36	TRDY	B36	+3.3V
A37	GND	B37	DEVSEL
A38	STOP	B38	GND
A39	+3.3V	B39	LOCK
A40	SDONE	B40	PERR
A41	SBO	B41	+3.3V

A42	GND	B42	SERR
A43	PAR	B43	+3.3V
A44	AD15	B44	C/BE1
A45	+3.3V	B45	AD14
A46	AD13	B46	GND
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD9	B49	GND
A52	C/BE0	B52	AD8
A53	+3.3V	B53	AD7
A54	AD6	B54	+3.3V
A55	AD4	B55	AD5
A56	GND	B56	AD3
A57	AD2	B57	GND
A68	AD0	B68	AD1
A59	+5V	B59	+5V
A60	REQ64	B60	ACK64
A61	+5V	B61	+5V
A62	+5V	B62	+5V

Table 4-12: PCI Slot

4.2.11 PCI Express x4 Slot

CN Label: **PCIE4X_1**

CN Type: 64-pin PCIe x4 slots

CN Location: See Figure 4-12

CN Pinouts: See Table 4-13

PCIe x4 expansion devices can be inserted into the PCIe x4 slots.

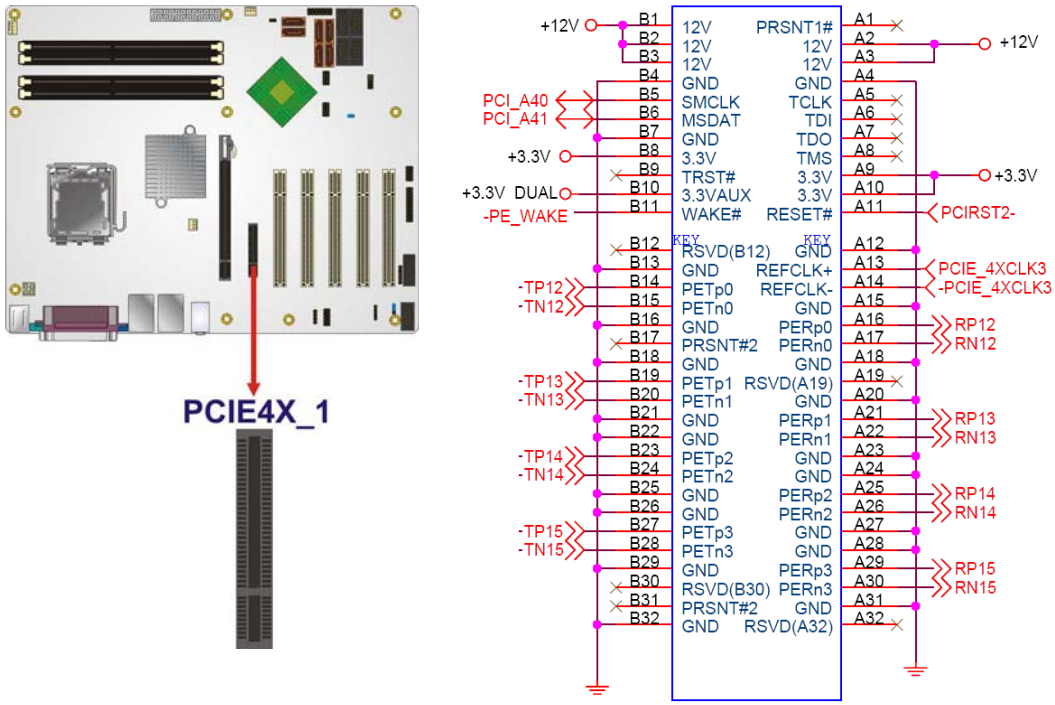


Figure 4-12: PCIe x4 Connector Locations

SIDE A				SIDE B			
PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
A1	N/C	A2	+12V	B1	+12V	B2	+12V
A3	+12V	A4	GND	B3	+12V	B4	GND
A5	N/C	A6	N/C	B5	SMCLK	B6	SMDAT
A7	N/C	A8	N/C	B7	GND	B8	+3.3V
A9	+3.3V	A10	+3.3V	B9	N/C	B10	3.3V
A11	RESET	A12	GND	B11	WAKE#	B12	N/C
A13	REFCLK+	A14	REFCLK-	B13	GND	B14	HSOp(0)
A15	GND	A16	HSIp(0)	B15	HSOn(0)	B16	GND
A17	HSIn(0)	A18	GND	B17	N/C	B18	GND
A19	N/C	A20	GND	B19	HSOp(1)	B20	HSOn(1)
A21	HSIp(1)	A22	HSIn(1)	B21	GND	B22	GND
A23	GND	A24	GND	B23	HSOp(2)	B24	HSOn(2)
A25	HSIp(2)	A26	HSIn(2	B25	GND	B26	GND
A27	GND	A28	GND	B27	HSOp(3)	B28	HSOn(3)

A29	HSIp(3)	A30	HSIn(3)	B29	GND	B30	N/C
A31	GND	A32	N/C	B31	N/C	B32	GND

Table 4-13: PCIe x4 Pinouts

4.2.12 PCI Express x16 Slot

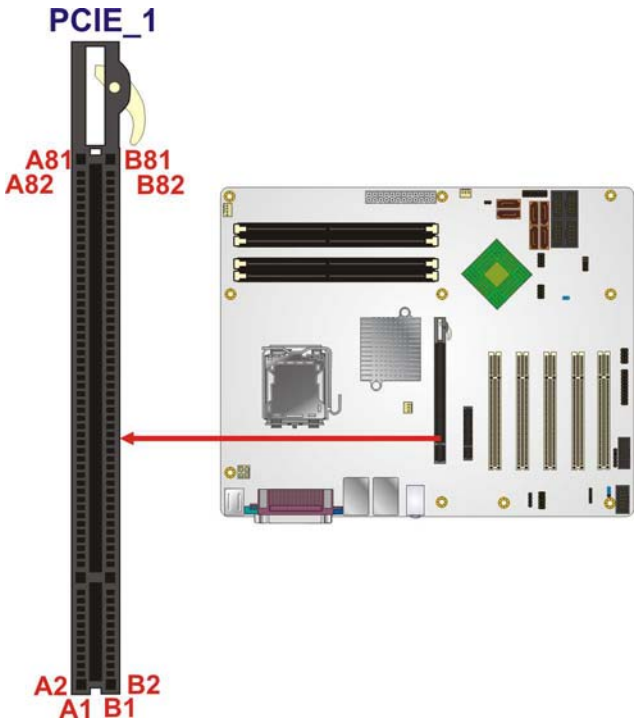
CN Label: **PCIE_1**

CN Type: 164-pin PCIe x16 slot

CN Location: See Figure 4-23

CN Pinouts: See **Table 4-14** (**Side A**) **Table 4-15 (Side B)**

PCIe x16 expansion devices can be inserted into the PCIe x16 slot.



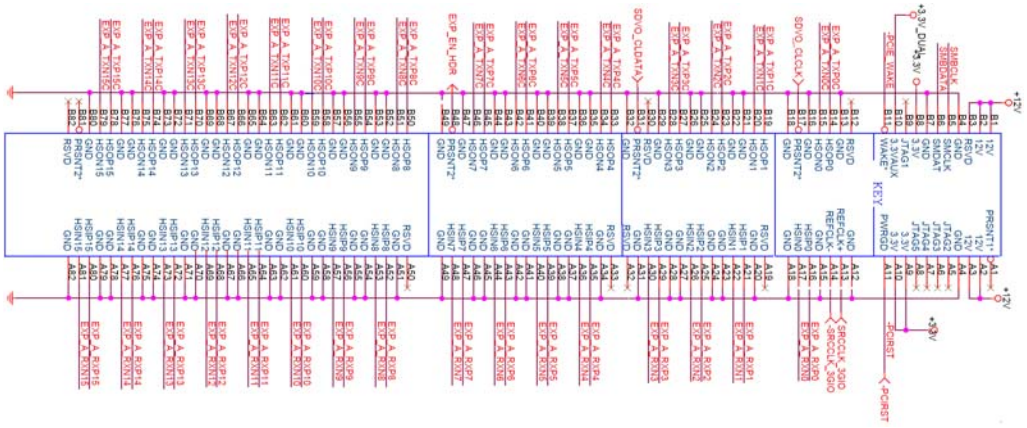


Figure 4-13: PCIe x16 Connector Location

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
A1	Name	A22	HSIn(1)	A43	HSIp(6)	A64	HSIp(11)
A2	PRSNT#1	A23	GND	A44	HSIn(6)	A65	HSIn(11)
A3	+12v	A24	GND	A45	GND	A66	GND
A4	+12v	A25	HSIp(2)	A46	GND	A67	GND
A5	GND	A26	HSIn(2)	A47	HSIp(7)	A68	HSIp(12)
A6	JTAG2	A27	GND	A48	HSIn(7)	A69	HSIn(12)
A7	JTAG3	A28	GND	A49	GND	A70	GND
A8	JTAG4	A29	HSIp(3)	A50	RSVD	A71	GND
A9	JTAG5	A30	HSIn(3)	A51	GND	A72	HSIp(13)
A10	+3.3v	A31	GND	A52	HSIp(8)	A73	HSIn(13)
A11	+3.3v	A32	RSVD	A53	HSIn(8)	A74	GND
A12	PWRGD	A33	RSVD	A54	GND	A75	GND
A13	GND	A34	GND	A55	GND	A76	HSIp(14)
A14	REFCLK+	A35	HSIp(4)	A56	HSIp(9)	A77	HSIn(14)
A15	REFCLK-	A36	HSIn(4)	A57	HSIn(9)	A78	GND
A16	GND	A37	GND	A58	GND	A79	GND
A17	HSIp(0)	A38	GND	A59	GND	A80	HSIp(15)
A18	HSIn(0)	A39	HSIp(5)	A60	HSIp(10)	A81	HSIn(15)
A19	GND	A40	HSIn(5)	A61	HSIn(10)	A82	GND
A20	RSVD	A41	GND	A62	GND		

A21	GND	A42	GND	A63	GND		

Table 4-14: PCIe x16 Side A Pinouts

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
B1	+12v	B22	GND	B43	GND	B64	GND
B2	+12v	B23	HSOp(2)	B44	GND	B65	GND
B3	RSVD	B24	HSOn(2)	B45	HSOp(7)	B66	HSOp(12)
B4	GND	B25	GND	B46	HSOn(7)	B67	HSOn(12)
B5	SMCLK	B26	GND	B47	GND	B68	GND
B6	SMDAT	B27	HSOp(3)	B48	PRSNT#2	B69	GND
B7	GND	B28	HSOn(3)	B49	GND	B70	HSOp(13)
B8	+3.3v	B29	GND	B50	HSOp(8)	B71	HSOn(13)
B9	JTAG1	B30	RSVD	B51	HSOn(8)	B72	GND
B10	3.3Vaux	B31	PRNT#2	B52	GND	B73	GND
B11	WAKE#	B32	GND	B53	GND	B74	HSOp(14)
B12	RSVD	B33	HSOp(4)	B54	HSOp(9)	B75	HSOn(14)
B13	GND	B34	HSOn(4)	B55	HSOn(9)	B76	GND
B14	HSOp(0)	B35	GND	B56	GND	B77	GND
B15	HSOn(0)	B36	GND	B57	GND	B78	HSOp(15)
B16	GND	B37	HSOp(5)	B58	HSOp(10)	B79	HSOn(15)
B17	PRSNT#2	B38	HSOn(5)	B59	HSOn(10)	B80	GND
B18	GND	B39	GND	B60	GND	B81	PRSNT#2
B19	HSOp(1)	B40	GND	B61	GND	B82	RSVD#2
B20	HSOn(1)	B41	HSOp(6)	B62	HSOp(11)		
B21	GND	B42	HSOn(6)	B63	HSOn(11)		

Table 4-15: PCIe x16 Side B Pinouts

4.2.13 SATA Drive Connectors

CN Label: SATA1, SATA2, SATA3, SATA4, SATA5 and SATA6

CN Type: 7-pin SATA drive connectors

CN Location: See Figure 4-14

CN Pinouts: See Table 4-16

The six SATA drive connectors are each connected to a second generation SATA drive. Second generation SATA drives transfer data at speeds as high as 300Mb/s. The SATA drives can be configured in a RAID configuration.

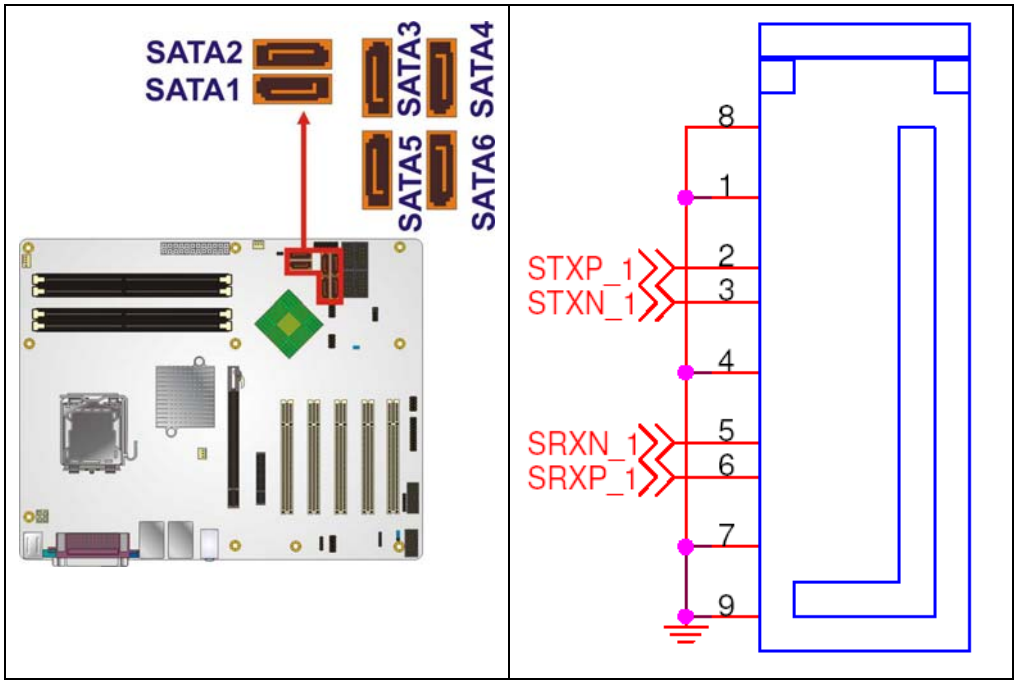


Figure 4-14: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 4-16: SATA Drive Connector Pinouts

4.2.14 Serial Port Connectors (RS-232)

CN Label: **COM3, COM4, COM5 and COM6**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 4-15**

CN Pinouts: See **Table 4-17**

The four 10-pin serial port connectors provide four additional RS-232 serial communications channels. The four internal RS-232 serial port connectors can be connected to external RS-232 serial port devices.

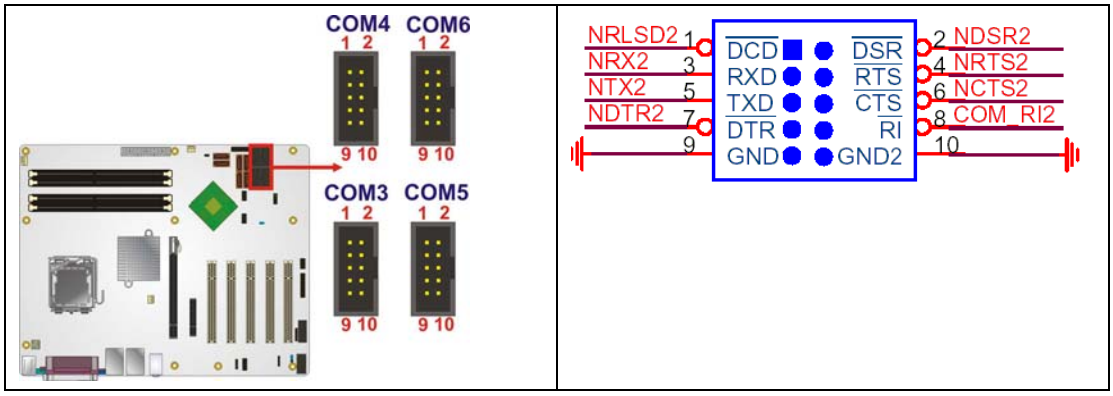


Figure 4-15: RS-232 COM Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Direct (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request To Send (RTS)
5	Transmit Data (TXD)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	Ground (GND)

Table 4-17: RS-232 COM Connector Pinouts

4.2.15 Serial Port Connector (COM 2)(RS-232, RS-422 or RS-485)

CN Label: **COM2**

CN Type: 14-pin header (2x7)

CN Location: See **Figure 4-16**

CN Pinouts: See **Table 4-18**

The 14-pin serial port connector connects to the COM 2 serial communications channels. COM 2 is a multi function channel. In default mode COM 2 is an RS-232 serial communication channel but, with the COM 2 function select jumper, can be configured as either an RS-422 or RS-485 serial communications channel.

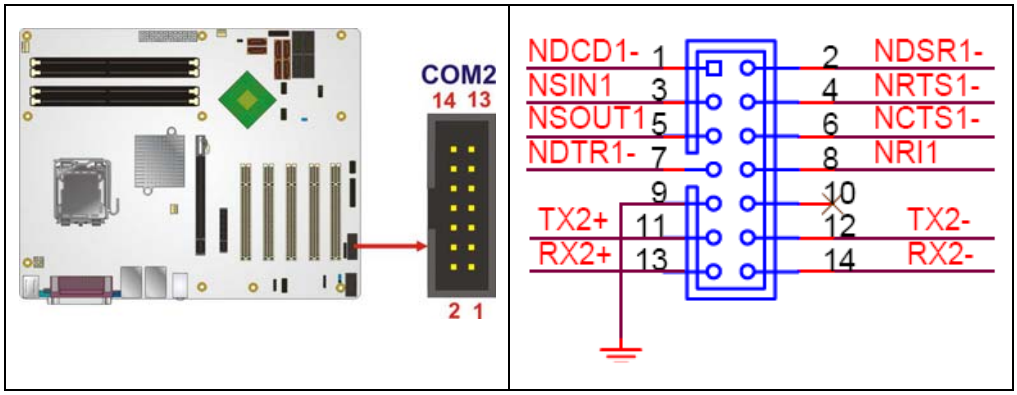


Figure 4-16: RS-232/422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND
11	TXD+	12	TX-
13	RX+	14	RX-

Table 4-18: RS-232/RS-485 Serial Port Connector Pinouts

4.2.16 SPDIF Connector

CN Label: CN1

CN Type: 5-pin header

CN Location: See Figure 4-17

CN Pinouts: See Table 4-19

Use the SPDIF connector to connect digital audio devices to the system.

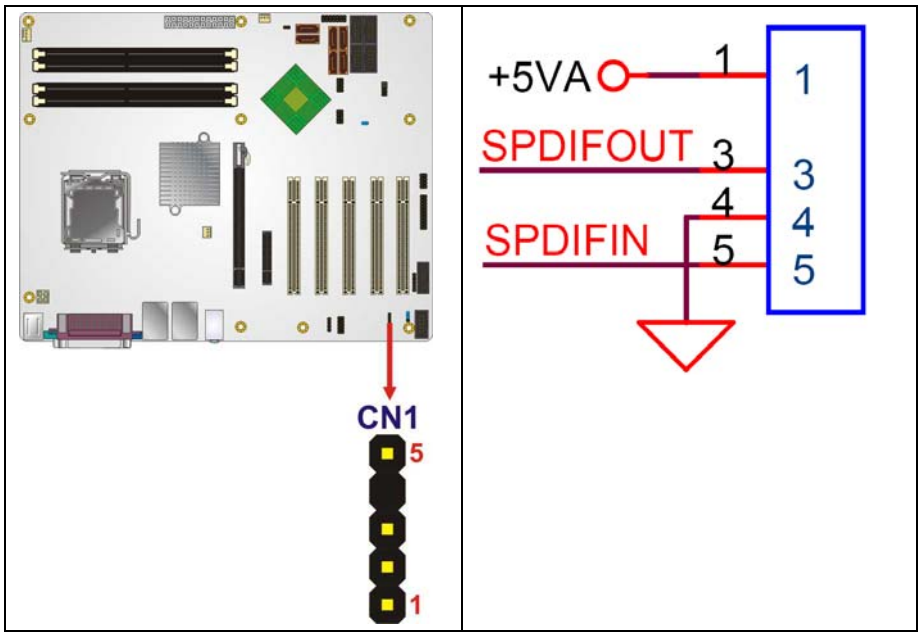


Figure 4-17: SPDIF Connector Pinout Locations

PIN	DESCRIPTION
1	VCC AUDIO
2	NC
3	SPDIF OUT
4	GND AUDIO
5	SPDIF IN

Table 4-19: SPDIF Connector Pinouts

4.2.17 SPI Flash Connector

CN Label: CN4

CN Type: 8-pin header

CN Location: See Figure 4-18

CN Pinouts: See Table 4-20

Use the SPI Flash connector to connect a serial peripheral interface (SPI) flash memory module to the IMBA-9654.

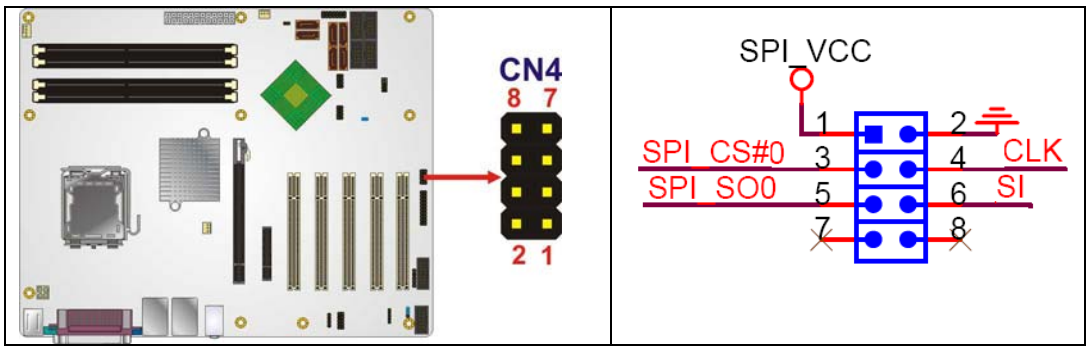


Figure 4-18: SPI Flash Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	CS#	4	CLOCK
5	SO	6	SI
7	N/C	8	N/C

Table 4-20: SPI Flash Connector Pinouts

4.2.18 Trusted Platform Module (TPM) Connector

CN Label: **TPM1**

CN Type: 20-pin header (2x10)

CN Location: See **Figure 4-19**

CN Pinouts: See **Table 4-21**

The Trusted Platform Module (TPM) connector secures the system on bootup.

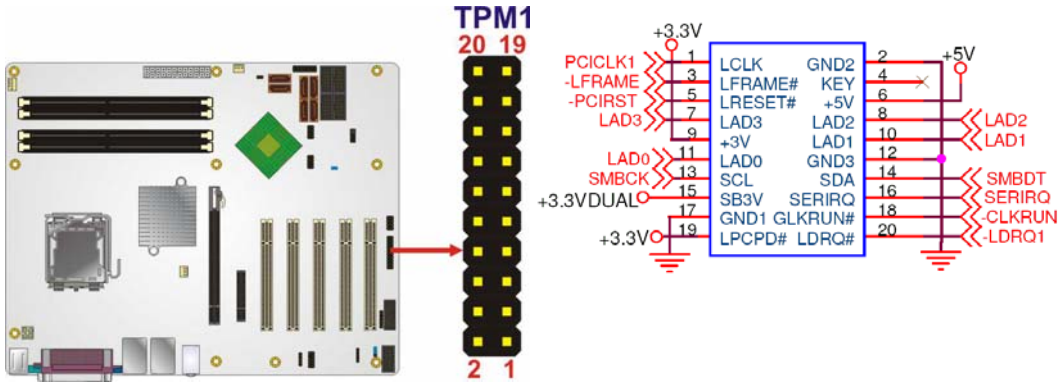


Figure 4-19: TPM Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCLK	2	GND2
3	LFRAME#	4	KEY
5	LRESET#	6	+5V
7	LAD3	8	LAD2
9	+3.4V	10	LAD1
11	LAD0	12	GND3
13	SCL	14	SDA
15	SB3.3V	16	SERIRQ
17	GND1	18	GLKRUN#
19	LPCPD#	20	LDRQ#

Table 4-21: TPM Connector Pinouts

4.2.19 USB Connectors (Internal)

CN Label: USB1, USB2

CN Type: 8-pin header (2x4)

CN Location: See Figure 4-20

CN Pinouts: See Table 4-22

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

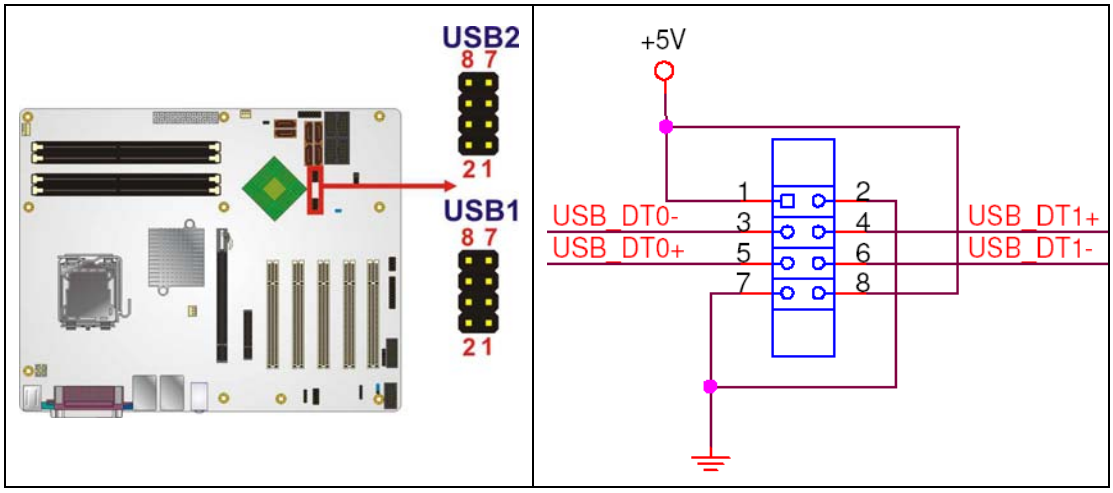


Figure 4-20: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATAN-	4	DATAM+
5	DATAN+	6	DATAN-
7	GND	8	VCC

Table 4-22: USB Port Connector Pinouts

4.3 External Peripheral Interface Connectors

The external peripheral interface connectors on the back panel are connected to devices externally when the IMBA-9654 is installed in a chassis. The peripheral connectors on the rear panel are:

- 1 x Keyboard/mouse connector
- 1 x Parallel port connector
- 2 x RJ-45 Ethernet connector

- 3 x Audio jacks
- 4 x USB 2.0 connectors
- 1 x VGA connector
- 1 x Serial port connector
-

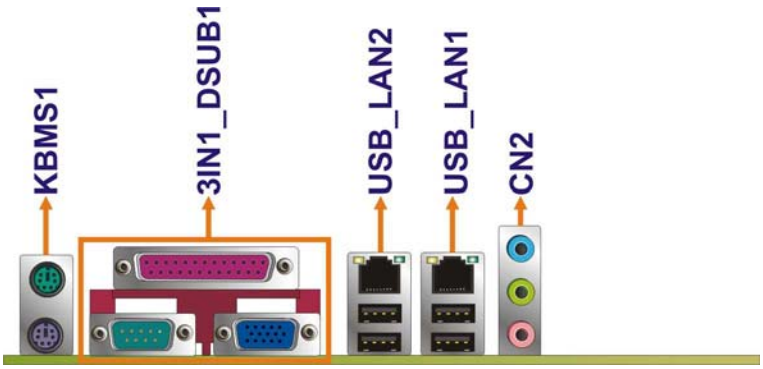


Figure 4-21: IMBA-9654 External Interface Connectors

4.3.1 Keyboard/Mouse Connector

CN Label:	KBMS1
CN Type:	PS/2 connector
CN Location:	See Figure 4-21
CN Pinouts:	See Figure 4-22 and Table 4-23

The IMBA-9654 keyboard and mouse connectors are standard PS/2 connectors.

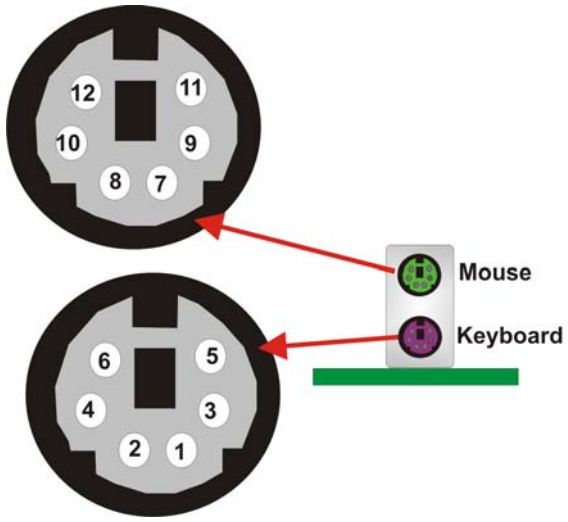


Figure 4-22: PS/2 Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	L_KDAT	7	L_MDAT
2	NC	8	NC
3	GND	9	GND
4	5V	10	5V
5	L_KCLK	11	L_MCLK
6	NC	12	NC

Table 4-23: PS/2 Connector Pinouts

4.3.2 Parallel Port Connector

CN Label: LPT1

CN Type: DB-25

CN Location: See Figure 4-21

CN Pinouts: See Figure 4-23 and Table 4-24

These ports are usually connected to a printer. IMBA-9654 includes one on-board parallel ports accessed through one 25-pin D-type female connector.

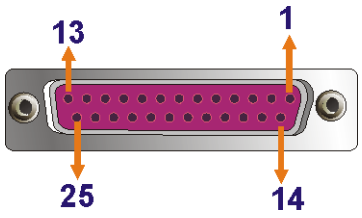


Figure 4-23: Parallel Port Connector Pinout Locations

PIN	Description	PIN	Description
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND		

Table 4-24: Parallel Pinouts

4.3.3 Audio Connectors

CN Label: CN2

CN Type: Audio jack

CN Location: See Figure 4-21

CN Pinouts: See Figure 4-24

-
- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.

- **Speaker Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.
-

Figure 4-24: Audio Connector

4.3.4 LAN Connectors

CN Label: J20 and J21

CN Type: RJ-45

CN Location: **Figure 4-21**

CN Pinouts: **Table 4-25**

The IMBA-9654 is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TXA+	5	TXC-
2	TXA-	6	TXB-
3	TXB+	7	TXD+
4	TXC+	8	TXD-

Table 4-25: LAN Pinouts

Figure 4-25: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 4-26**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
YELLOW	Activity	GREEN	Linked

Table 4-26: RJ-45 Ethernet Connector LEDs

4.3.5 USB Connectors

CN Label: USB_LAN1, USB_LAN2

CN Type: Dual USB port

CN Location: See Figure 4-21

CN Pinouts: See Figure 4-26 and Table 4-27

USB devices connect directly to the USB connectors on the external peripheral connector panel.

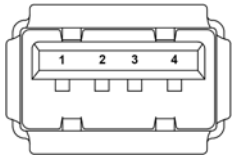


Figure 4-26: USB Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	5	VCC
2	USBD0-	6	USBD0-
3	USBD0+	7	USBD0+
4	GND	8	GND

Table 4-27: USB Connector Pinouts

4.3.6 VGA Connector

CN Label: VGA

CN Type: HD-D-sub 15 Female connector

CN Location: See Figure 4-21 (labeled 6)

CN Pinouts: See **Figure 4-27** and **Table 4-28**

The standard HD-D-sub 15 female connector connects to a CRT or LCD monitor.

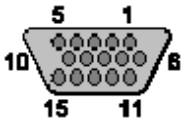


Figure 4-27: VGA Connector

PIN	Description	PIN	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDC CLK		

Table 4-28: VGA Connector Pinouts

4.3.7 Serial Communications Connector

CN Label: COM1

CN Type: D-sub 9 Male connector

CN Location: See Figure 4-21 (labeled 7)

CN Pinouts: See **Figure 4-28** and **Table 4-29**

The serial connector on the external interface panel provides serial connection in the RS-232 mode.

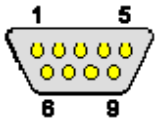


Figure 4-28: Serial Communications Connector Pinout Locations

PIN	DESCRIPTION
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

Table 4-29: COM1 RS-232 Mode Connector Pinouts

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Chapter

5

Installation

5.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IMBA-9654 may result in permanent damage to the IMBA-9654 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-9654. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-9654, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the IMBA-9654, place it on an antic-static pad. This reduces the possibility of ESD damaging the IMBA-9654.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold the PCB by the edges.

5.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the IMBA-9654 is installed. All installation notices pertaining to the installation of the IMBA-9654 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the IMBA-9654 and injury to the person installing the motherboard.

5.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the IMBA-9654, IMBA-9654 components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the IMBA-9654 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the IMBA-9654 on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the IMBA-9654 off:

- When working with the IMBA-9654, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the IMBA-9654 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

5.2.2 Installation Checklist

The following checklist is provided to ensure the IMBA-9654 is properly installed.

- All the items in the packing list are present
- The CPU is installed
- The CPU cooling kit is properly installed
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The IMBA-9654 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - Primary and secondary IDE device
  - SATA drives
  - Power supply
  - USB cables
  - Serial port cables
  - I/O Shielding
- The following external peripheral devices are properly connected to the chassis:
  - VGA screen
  - Keyboard
  - Mouse

- RS-232 serial communications device
- Parallel port device (printer)
- LAN connection

5.3 Unpacking

5.3.1 Unpacking Precautions

When the IMBA-9654 is unpacked, please do the following:

- Follow the anti-static precautions outlined in Section 5.1.
- Make sure the packing box is facing upwards so the IMBA-9654 does not fall out of the box.
- Make sure all the components in the checklist shown in **Chapter 3** are present.

NOTE:

If some of the components listed in the checklist in **Chapter 3** are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IMBA-9654 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

5.4 CPU, CPU Cooling Kit and DIMM Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, IMBA-9654 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the IMBA-9654. If one of these components is not installed the IMBA-9654 cannot run.

5.4.1 LGA775 CPU Installation

NOTE:

Enabling Hyper-Threading Technology on your system requires meeting all of the platform requirements listed below:

- **CPU**: An Intel® Pentium 4 Processor with HT Technology must be installed
- **Chipset**: An Intel® Chipset that supports HT Technology (that has been met by the IMBA-9654)
- **OS**: An operating system that has optimizations for HT Technology

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

The LGA775 socket is shown in Figure 5-1.

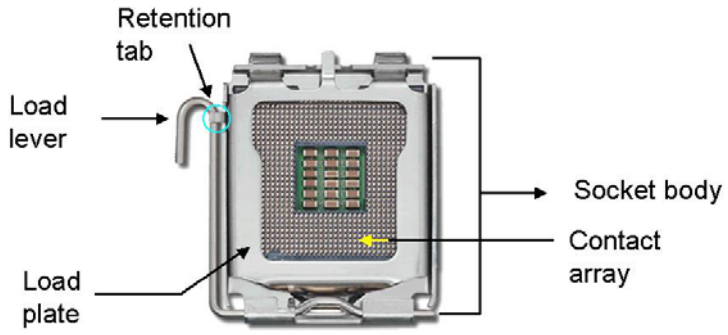


Figure 5-1: Intel LGA775 Socket

To install a socket LGA775 CPU onto the IMBA-9654, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Remove the protective cover.** Remove the black protective cover by prying it off the load plate. To remove the protective cover, locate the "**REMOVE**" sign and use your fingernail to pry the protective cover off. See **Figure 5-2**.

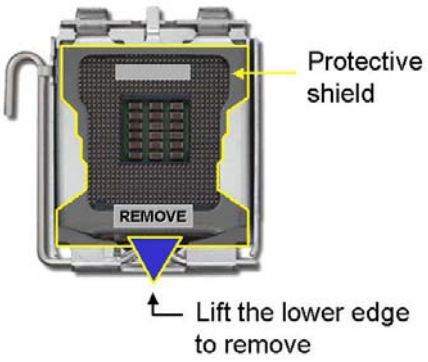


Figure 5-2: Remove the CPU Socket Protective Shield

Step 2: **Open the socket**. Disengage the load lever by pressing the lever down and slightly outward to clear the retention tab. Rotate the load lever to a fully open position. Then rotate the load plate towards the opposite direction. See **Figure 5-3**.

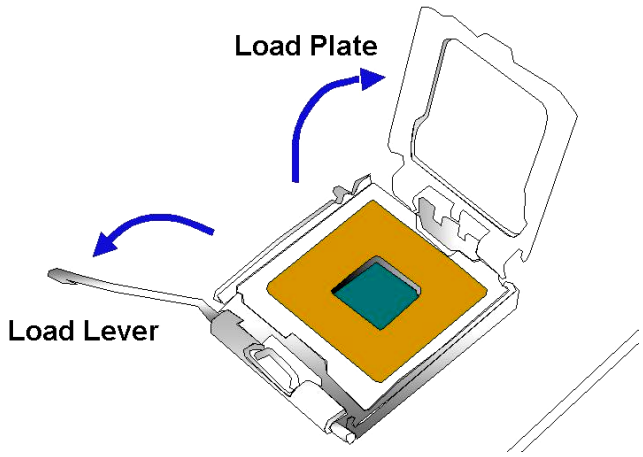


Figure 5-3: Open the CPU Socket Load Plate

Step 3: **Inspect the CPU socket** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 4: **Orientate the CPU properly**. Make sure the IHS (Integrated Heat Sink) side is facing upward.

Step 5: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the

CPU socket.

Step 6: **Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

Step 7: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 5-4**.

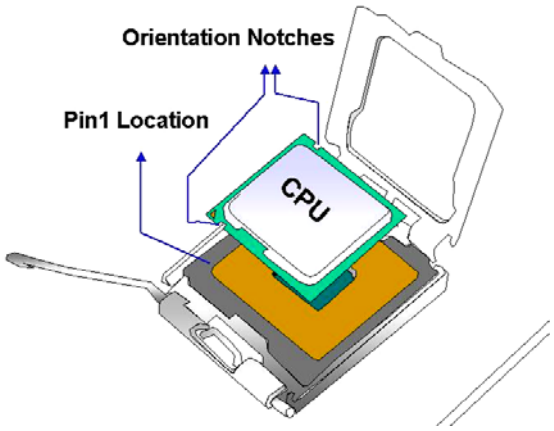


Figure 5-4: Insert the Socket LGA775 CPU

Step 8: **Close the CPU socket.** Close the load plate and engage the load lever by pushing it back to its original position. Secure the load lever under the retention tab on the side of CPU socket.

Step 9: **Connect the CPU 12V cable.** After the cooling kit is installed connect the CPU cable to the CPU 12V power connector

5.4.2 LGA775 Cooling Kit Installation

WARNING:

It is strongly recommended that you DO NOT use the original heat sink and cooler provided by Intel on the IMBA-9654.

IEI's cooling kits include a support bracket that is combined with the heat sink mounted on the CPU to counterweigh and balance the load on both sides of the PCB.

Figure 5-5: IEI CF-520 Cooling Kit

Figure 5-6: IEI CF-775A-RS Cooling Kit

Two optional, separately purchased LGA775 IEI CPU cooling kits are available. The IEI CF-520 is shown in **Figure 5-5** and the CF-775A-RS is shown **Figure 5-6** can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the [Fan model#] heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit follow the instructions below.

Step 1: **Place the cooling kit onto the socket LGA775 CPU**. Make sure the CPU cable can be properly routed when the cooling kit is installed.

Step 2: **Properly align the cooling kit**. Make sure the four spring screw fasteners can pass through the pre-drilled holes on the PCB.

Step 3: **Mount the cooling kit**. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the predrilled holes on the bottom of the PCB.

Step 4: **Secure the cooling kit**. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See **Figure 5-7**)

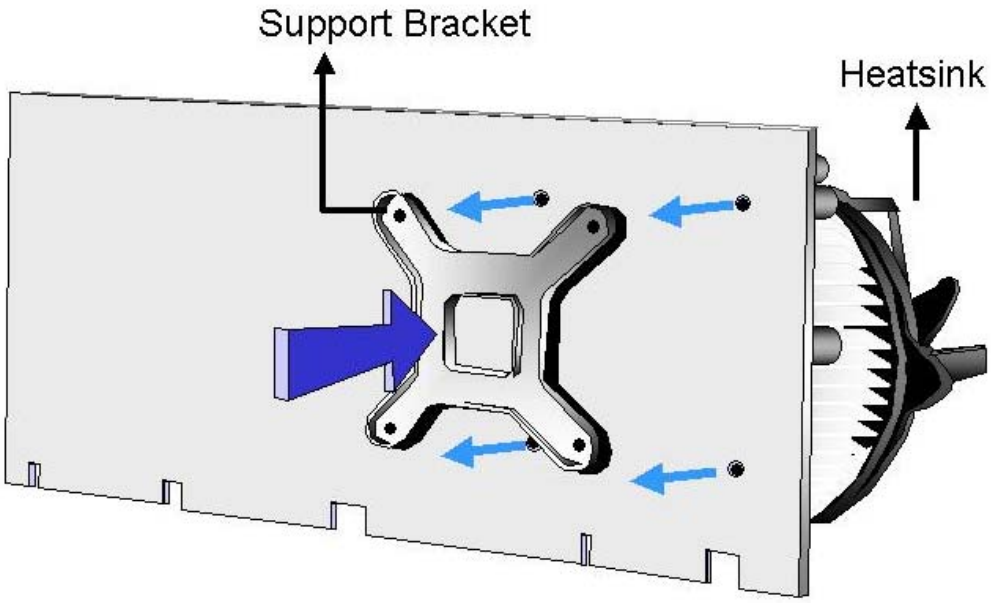


Figure 5-7: Securing the Heat sink to the PCB Board

Step 5: **Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

Step 6: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the IMBA-9654. Carefully route the cable and avoid heat generating chips and fan blades.

5.4.3 DIMM Installation

WARNING:

Using incorrectly specified DIMM may cause permanently damage the IMBA-9654. Please make sure the purchased DIMM complies with the memory specifications of the IMBA-9654. DIMM specifications compliant with the IMBA-9654 are listed in **Chapter 2**.

To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 5-8**.

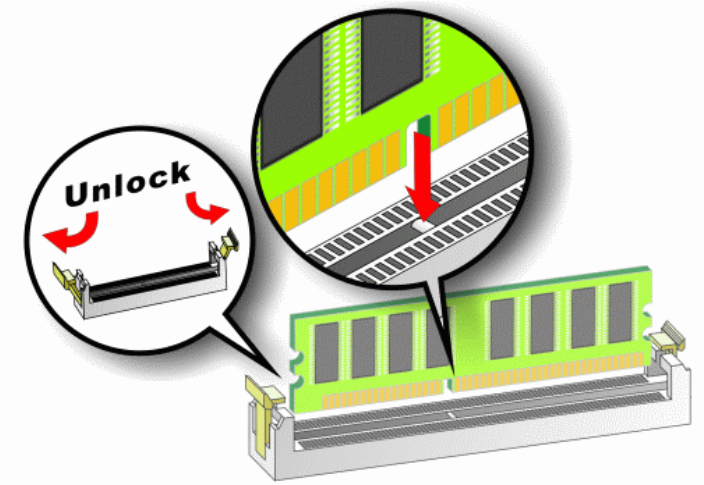


Figure 5-8: Installing a DIMM

Step 1: **Open the DIMM socket handles**. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 5-8**.

Step 2: **Align the DIMM with the socket**. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See **Figure 5-8**.

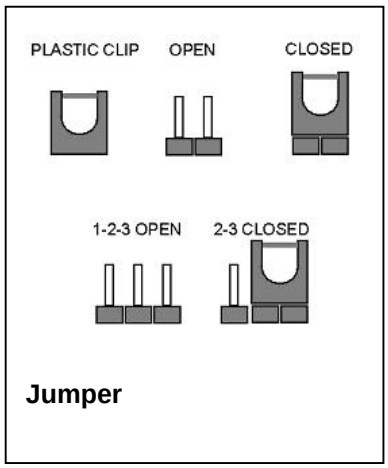
Step 3: **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-8**.

Step 4: **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

5.5 Jumper Settings

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



Jumper

Before the IMBA-9654 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the IMBA-9654 are listed in **Table 5-1**.

Description	Label	Type
Clear CMOS	JP2	3-pin header
RS-232/422/485 Serial Port Select	JP3	3-pin header

Table 5-1: Jumpers

5.5.1 Clear CMOS Jumper

Jumper Label: JP2

Jumper Type: 2-pin header

Jumper Settings: See Table 5-2

Jumper Location: See Figure 5-9

If the IMBA-9654 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 1 and 2 for a few seconds then remove the jumper cap and enable pins 1 and 2 to remain open.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu. The clear CMOS jumper settings are shown in **Table 5-2**.

Jumper Select	Description	
Open	Keep CMOS Setup	Default
Short	Clear CMOS Setup	

Table 5-2: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 5-9** below.

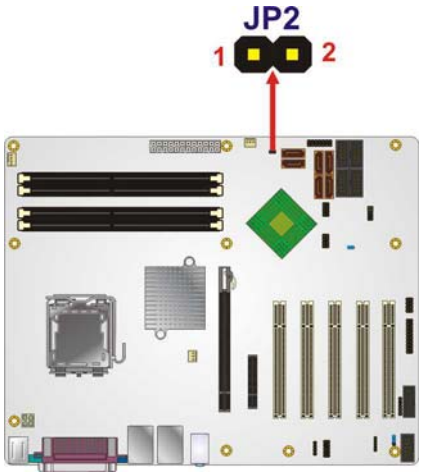


Figure 5-9: Clear CMOS Jumper

5.5.2 RS-232/RS-422/485 Serial Port Select Jumper

Jumper Label: **JP3**

Jumper Type: 3-pin header

Jumper Settings: See **Table 5-3**

Jumper Location: See **Figure 5-10**

The RS-232/RS-422/485 Serial Port Select jumper configures the serial port connector as an RS-232 or RS-422/485 serial port. The RS-232/RS-422/485 Serial Port Select jumper selection options are shown in **Table 5-3**.

AT Power Select	Description	
Short 1 – 2	RS-232	Default
Short 2 – 3	RS-422/485	

Table 5-3: Serial Port Mode Select Jumper Settings

The RS-232/RS-422/485 Serial Port Select jumper location is shown in **Figure 5-10** below.

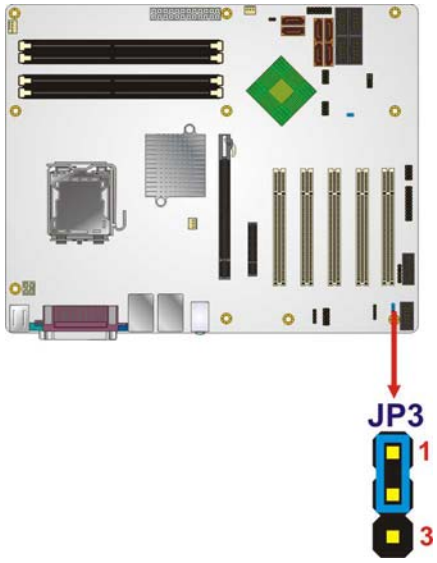


Figure 5-10: Serial Port Mode Select Jumper Pinout Locations

5.5.3 COM 3/4 Pin 9 Setting Jumper

Jumper Label: **JP5**

Jumper Type: 10-pin header

Jumper Settings: See **Table 5-4**

Jumper Location: See **Figure 5-11**

The COM 3/4 Pin 9 Setting jumper configures pin 9 on COM 3 and COM 4 as either a +5V, +12V power source or as a ring-in (RI) line. The COM 3/4 Pin 9 Setting jumper selection options are shown in **Table 5-4**.

COM ¾ RI Pin	Description	
Short 1 – 3	COM 3 RI Pin use +12V	
Short 3 – 5	COM 3 RI Pin use +5V	
Short 5 – 7	COM 3 RI Pin use +5V	
Short 7 – 9	COM 3 RI Pin use RI	Default
Short 2 – 4	COM 4 RI Pin use +12V	
Short 4 – 6	COM 4 RI Pin use +5V	

Short 6 – 8	COM 4 RI Pin use +5V	
Short 8 – 10	COM 4 RI Pin use RI	Default

Table 5-4: COM 3/4 Pin 9 Setting Jumper Settings

The COM 3/4 Pin 9 Setting jumper location is shown in **Figure 5-11** below.

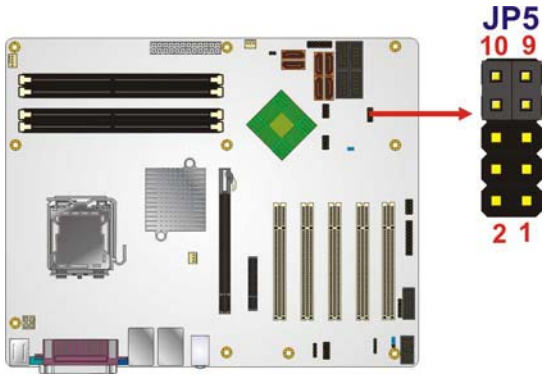


Figure 5-11: COM 3/4 Pin 9 Setting Jumper Location

5.6 Chassis Installation

5.6.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the IMBA-9654 must have air vents to allow cool air to move into the system and hot air to move out.

The IMBA-9654 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

NOTE:

IEI has a wide range of backplanes available. Please contact your IMBA-9654 vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about the available chassis.

5.7 Internal Peripheral Device Connections

5.7.1 Peripheral Device Cables

The cables listed in **Table 5-5** are shipped with the IMBA-9654.

Quantity	Type
1	Dual RS-232 cable
2	Single RS-232 cable
6	SATA drive cables
3	SATA drive power cables

Table 5-5: IEI Provided Cables

Separately purchased optional IEI items that can be installed are listed below:

- 2-port USB cable
- 4-port USB cable
- Dual RS-232/422/485 cable
- PCIe x16 VGA output SDVO card
- PCIe x16 DVI output SDVO card
- TPM module

For more details about the items listed above, please refer to **Chapter 3**. Installation of the accessories listed above are described in detail below.

5.7.2 Dual RS-232 Cable with Slot Bracket

The dual RS-232 cable slot connector consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a slot. To install the dual RS-232 cable, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the RS-232 connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connectors**. Insert one connector into each serial port box headers. See **Figure 5-12**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

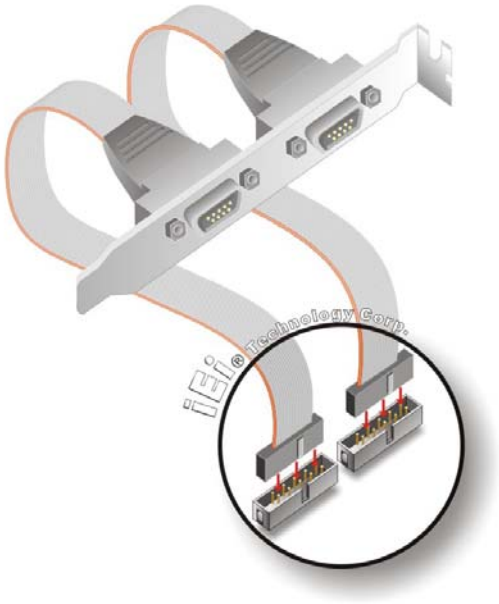


Figure 5-12: Dual RS-232 Cable Installation

Step 3: **Secure the bracket**. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis

5.7.3 Single RS-232 Cable with Slot Bracket

The single RS-232 cable consists of one serial port connectors attached to a serial communications cable that is then attached to a D-sub 9 male connector that is mounted onto a bracket. To install the single RS-232 cable, please follow the steps below.

Step 1: **Locate the connector**. The location of the RS-232 connector is shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Insert the connector into the serial port box header. See **Figure 5-13**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

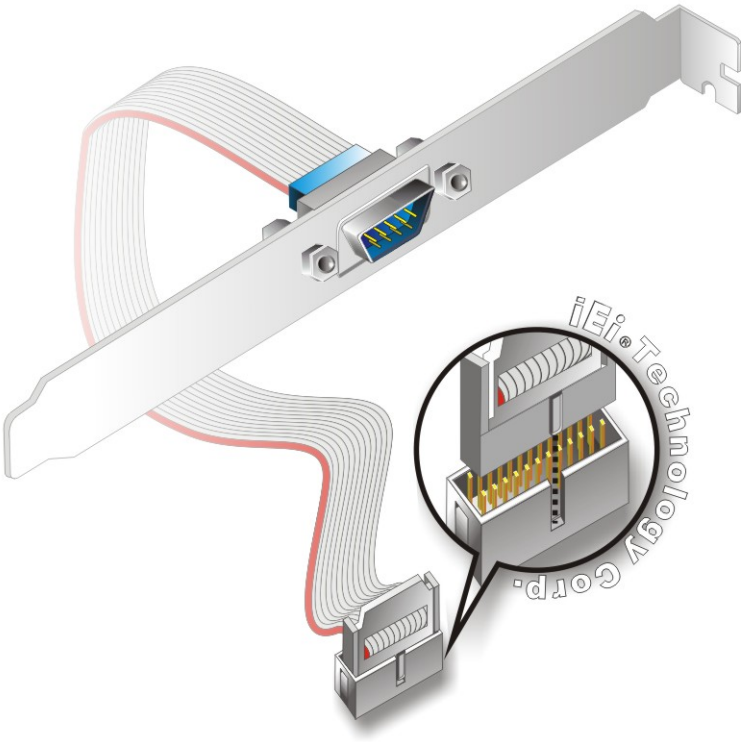


Figure 5-13: Single RS-232 Cable Installation

Step 3: **Secure the bracket**. The single RS-232 connector has one D-sub 9 male connector secured to a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis

5.7.4 Dual RS-232/422/485 Cables

The IMBA-9654 is shipped with one RS-232/422/485 dual serial port connector cable. The dual serial port connector cable connects the serial port connectors on the cable to the RS-232/422/485 serial port connectors on the IMBA-9654. Follow the steps below to connect the dual serial port connector cable.

Step 1: **Locate the serial port connector**. The location of the RS-232/422/485 serial port connector is shown in **Chapter 3**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the IMBA-9654 COM2 serial port connector.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the COM2 serial port connector on the IMBA-9654, connect the cable connector to the onboard connectors. See Figure 5-14.

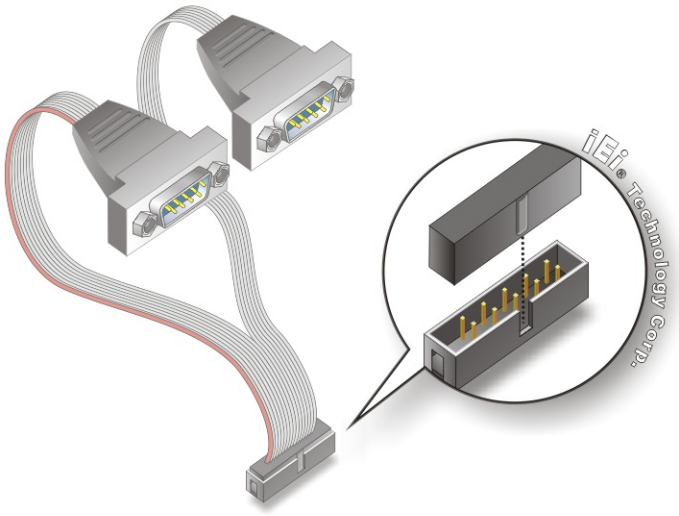


Figure 5-14: Dual Serial Port Connector Cable Connection

Step 4: **Attach DB-9 serial port connectors to the chassis**. The dual DB-9 serial port connectors can be inserted into dual preformed holes in the chassis. Once, inserted the DB-9 connectors should be secured to the chassis with retention screws.

5.7.5 SATA Drive Connection

The IMBA-9654 is shipped with six SATA drive cables and three SATA drive power cables. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-15**.

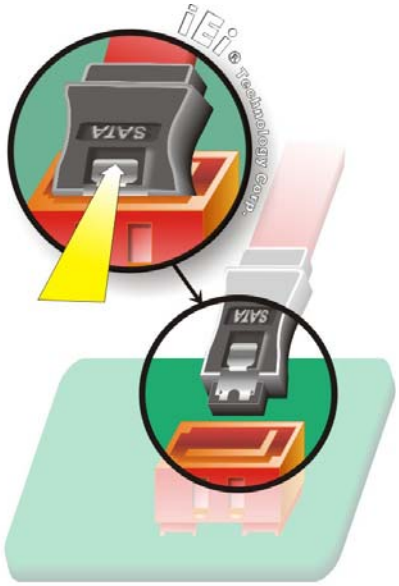


Figure 5-15: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 5-16**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-16**.

Figure 5-16: SATA Power Drive Connection

5.7.6 USB Cable (Dual Port)

The IMBA-9654 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 3**.

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the IMBA-9654 USB connector.

Step 3: **Insert the cable connectors**. Once the cable connectors are properly aligned with the USB connectors on the IMBA-9654, connect the cable connectors to the onboard connectors. See **Figure 5-17**.

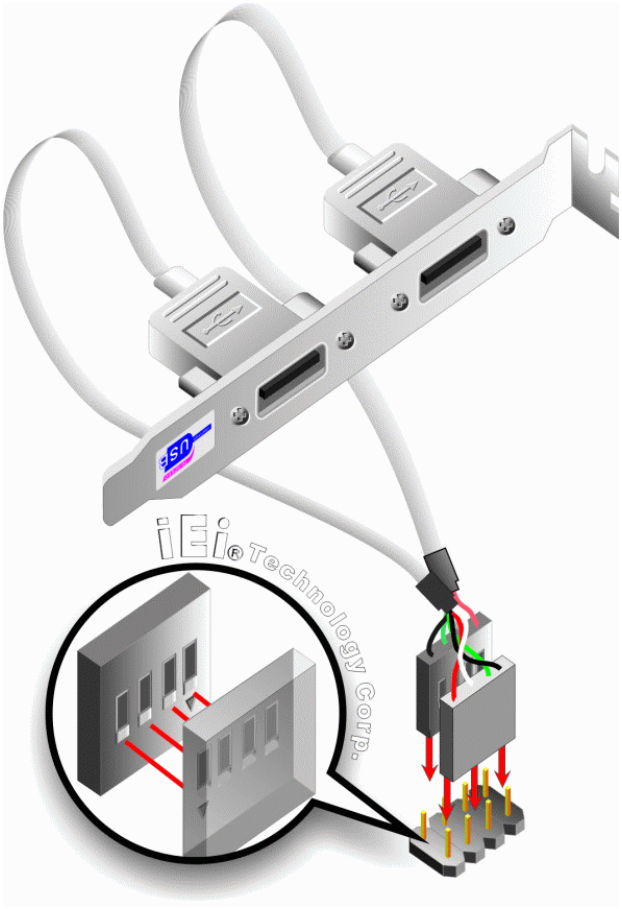


Figure 5-17: Dual USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

5.7.7 USB Cable (Four Port) (Optional)

Four port USB 2.0 cables can be separately purchased from IEI. To install a four port USB cable onto the IMBA-9654, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 4**.

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. Each cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the IMBA-9654 USB connectors.

Step 3: **Insert the cable connectors**.. Once the cable connectors are properly aligned with the USB connectors on the IMBA-9654, connect the cable connectors to the onboard connectors. See **Figure 5-17**.

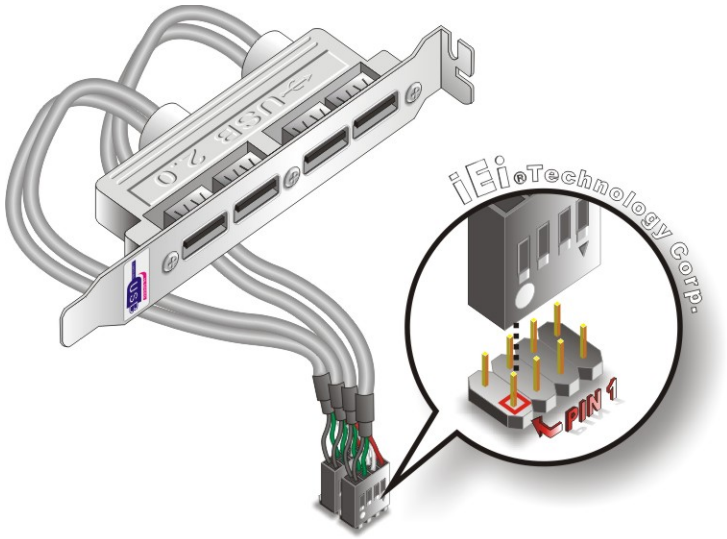


Figure 5-18: Four Port USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.**Step 0:**

5.8 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- VGA monitors
- RJ-45 Ethernet cable connectors
- USB devices

To install these devices, connect the corresponding cable connector from the actual device to the corresponding IMBA-9654 external peripheral interface connector making sure the pins are properly aligned.

5.8.1 Audio Connection

Audio signals are interfaced through three phone jack connections. The red phone jack is for Mic In, blue is for Line In and green is for Speaker Out. Follow the steps below to connect audio devices to the IMBA-9654.

Step 1: **Locate the audio phone jacks**. The location of the audio phone jacks are shown in **Chapter 3**.

Step 2: **Insert audio phone jack plugs**. Insert audio phone jack plugs into the audio phone jacks on the external peripheral interface. See Figure 5-19.

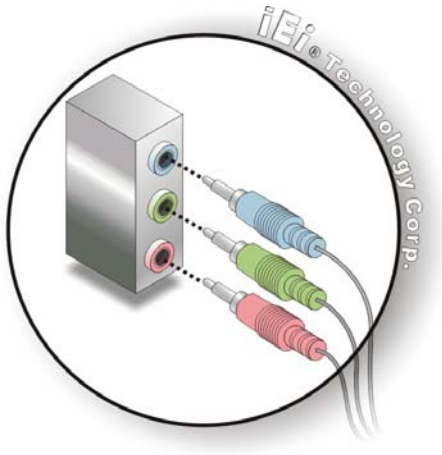


Figure 5-19: Audio Connectors

5.8.2 LAN Connection

There are two external RJ-45 LAN connectors for PCIe GbE connection. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the USB connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the IMBA-9654. See **Figure 5-20**.

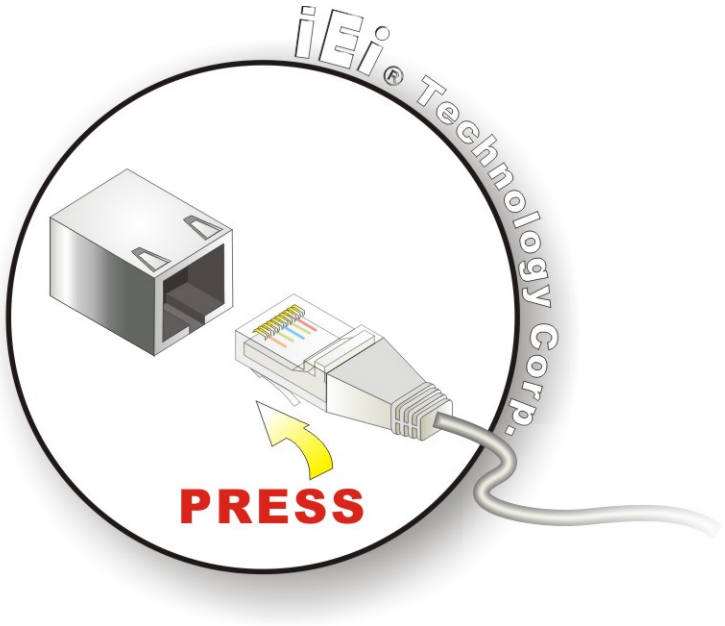


Figure 5-20: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

5.8.3 Parallel Device Connection

A single female DB-25 connector on the external peripheral interface panel connects to parallel communications devices. Follow the steps below to connect a parallel device.

Step 1: **Locate the DB-25 connector**. The location of the DB-25 connector is shown in **Chapter 3**.

Step 2: **Insert the DB-25 connector**. Insert the DB-25 connector of a parallel device into the DB-25 connector on the external peripheral interface. See Figure 5-21.

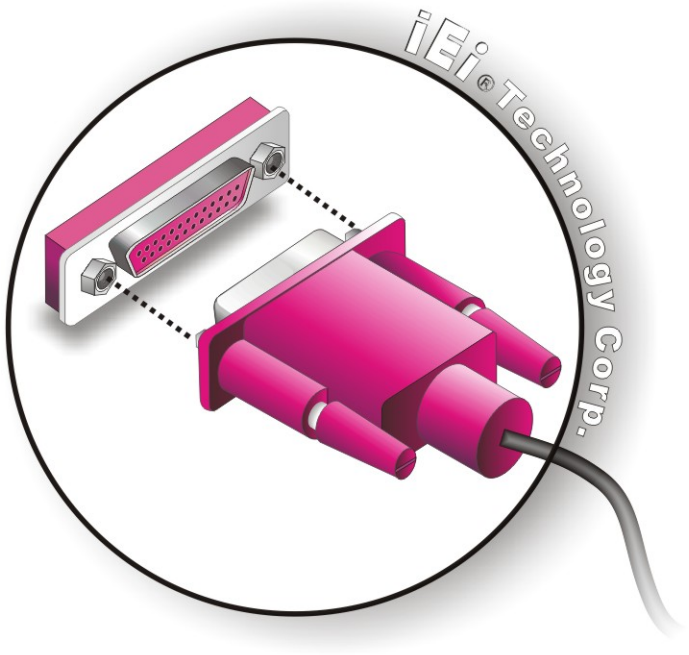


Figure 5-21: Parallel Device Connector

Step 3: **Secure the connector**. Secure the DB-25 connector to the external interface by tightening the two retention screws on either side of the connector.

5.8.4 PS/2 Keyboard and Mouse Connection

The IMBA-9654 has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the IMBA-9654.

Step 1: **Locate the dual PS/2 connector**. The location of the dual PS/2 connector is shown in **Chapter 3**.

Step 2: **Insert the keyboard/mouse connector**. Insert a PS/2 keyboard or mouse

connector into the appropriate PS/2 connector on the external peripheral interface connector. See Figure 5-22.

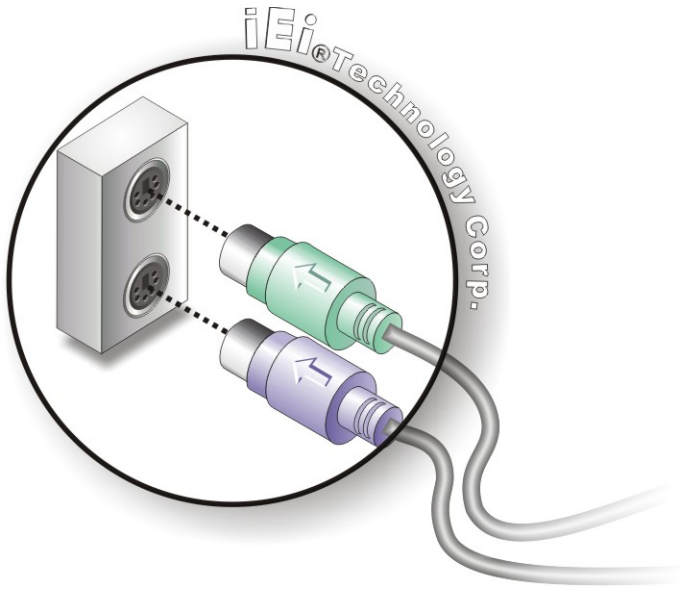


Figure 5-22: PS/2 Keyboard/Mouse Connector

5.8.5 Serial Device Connection

The IMBA-9654 has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the IMBA-9654.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 5-23.

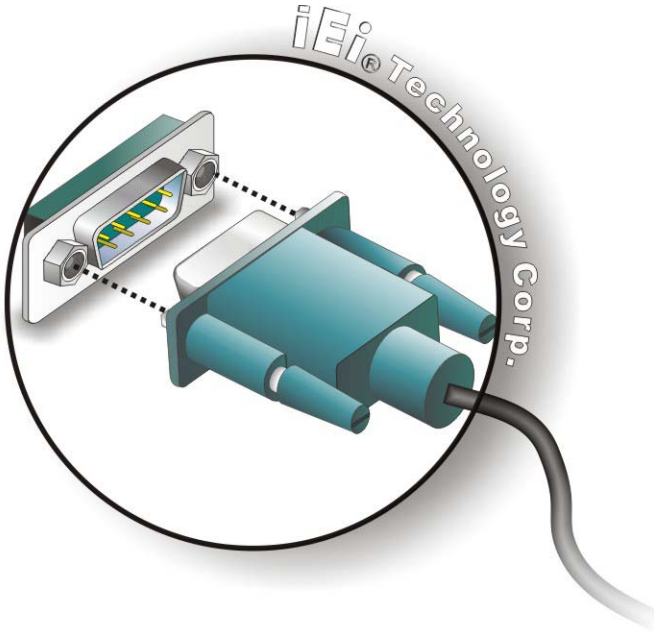


Figure 5-23: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

5.8.6 USB Connection (Dual Connector)

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the IMBA-9654.

Step 1: **Locate the USB Series "A" receptacle connectors**. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See Figure 5-24.

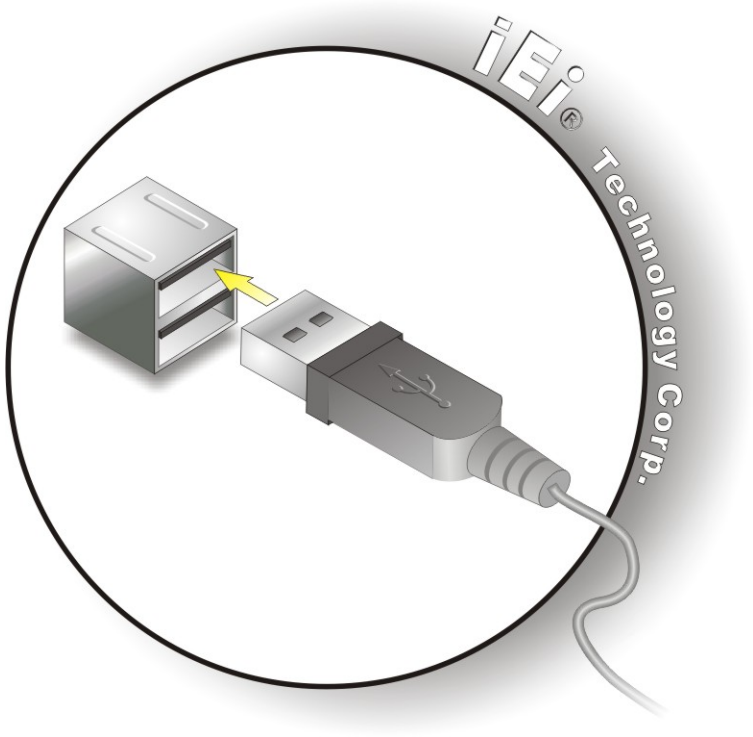


Figure 5-24: USB Connector

5.8.7 VGA Monitor Connection

The IMBA-9654 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the IMBA-9654, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the IMBA-9654. See **Figure 5-25**.

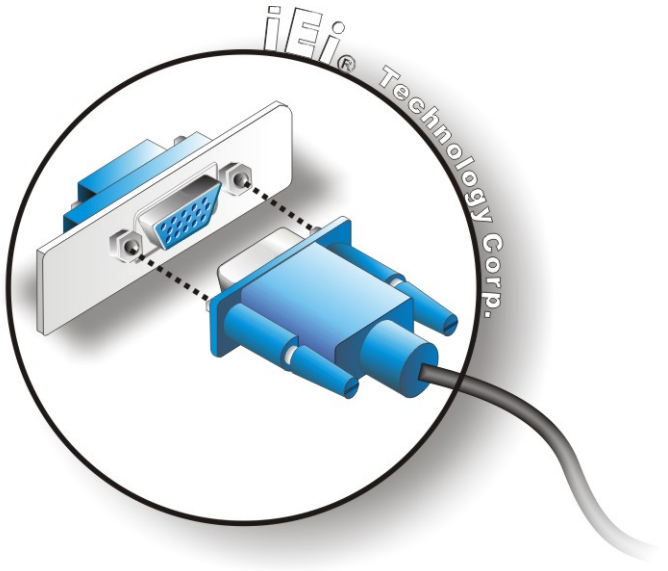


Figure 5-25: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

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Chapter

6

BIOS Screens

6.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

6.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen. 0.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

6.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 6-1: BIOS Navigation Keys

6.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

6.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **Chapter 5**.

6.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

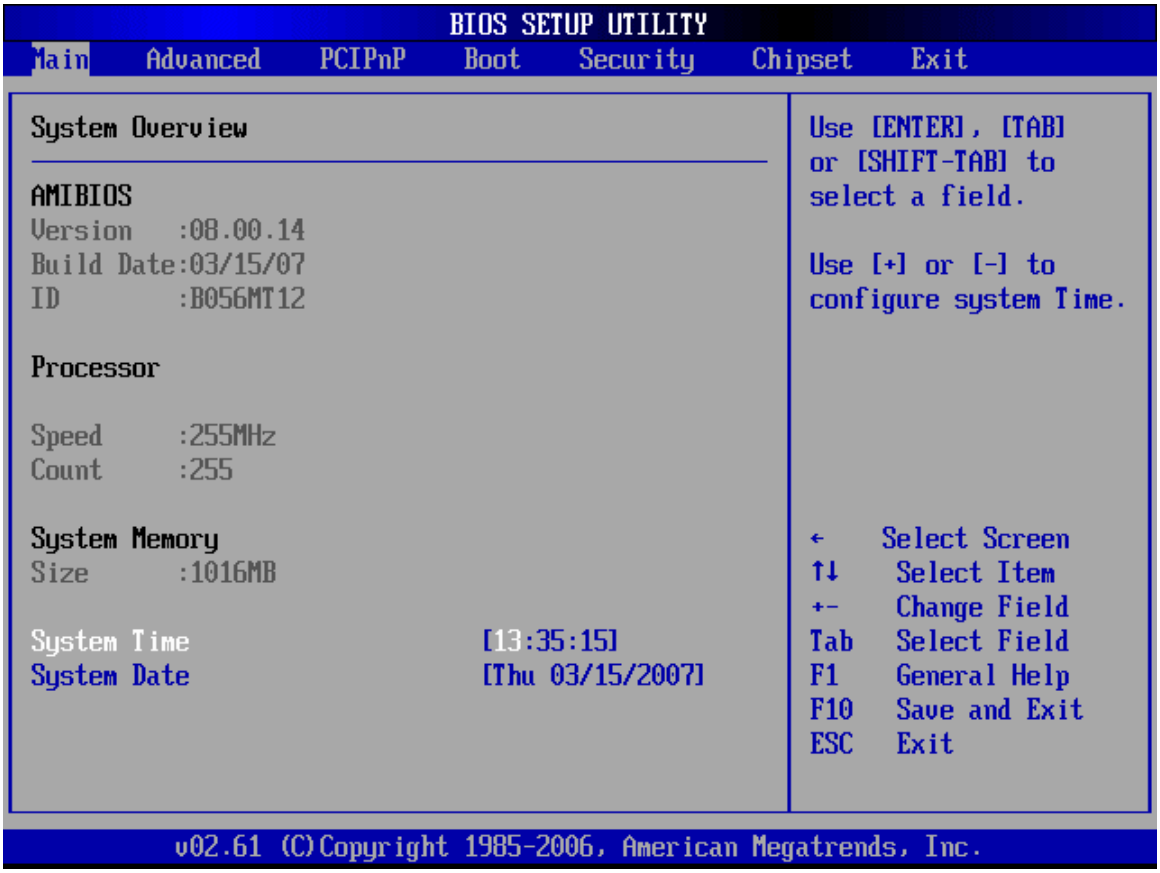
- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes power management settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

6.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID

- **Processor**: Displays auto-detected CPU specifications
  - **Type**: Names the currently installed processor
  - **Speed**: Lists the processor speed
  - **Count**: The number of CPUs on the motherboard
- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

6.3 Advanced

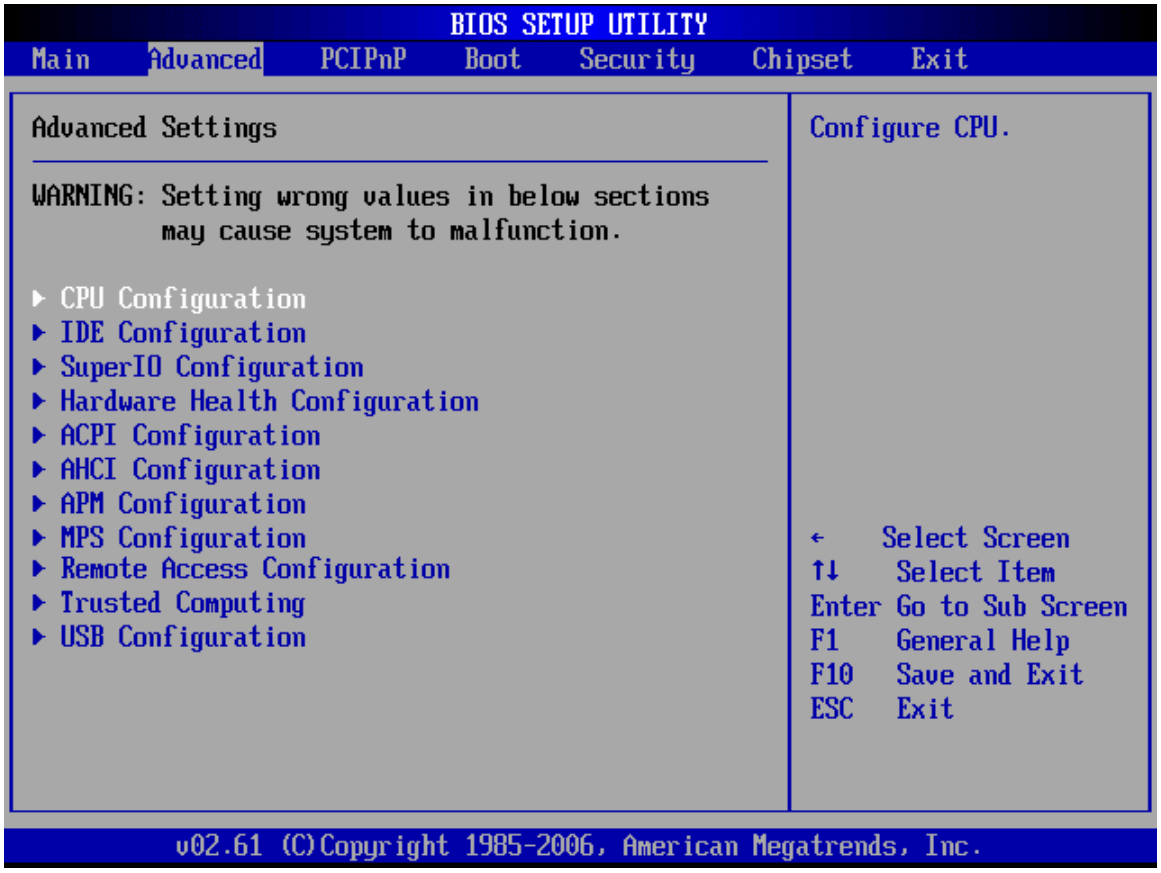
Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

- **CPU Configuration** (see Section 6.3.1)
- **IDE Configuration** (see Section 6.3.2)
- **SuperIO Configuration** (see Section 6.3.3)
- **Hardware Health Configuration** (see Section 6.3.4)
- **ACPI Configuration** (see Section 6.3.5)

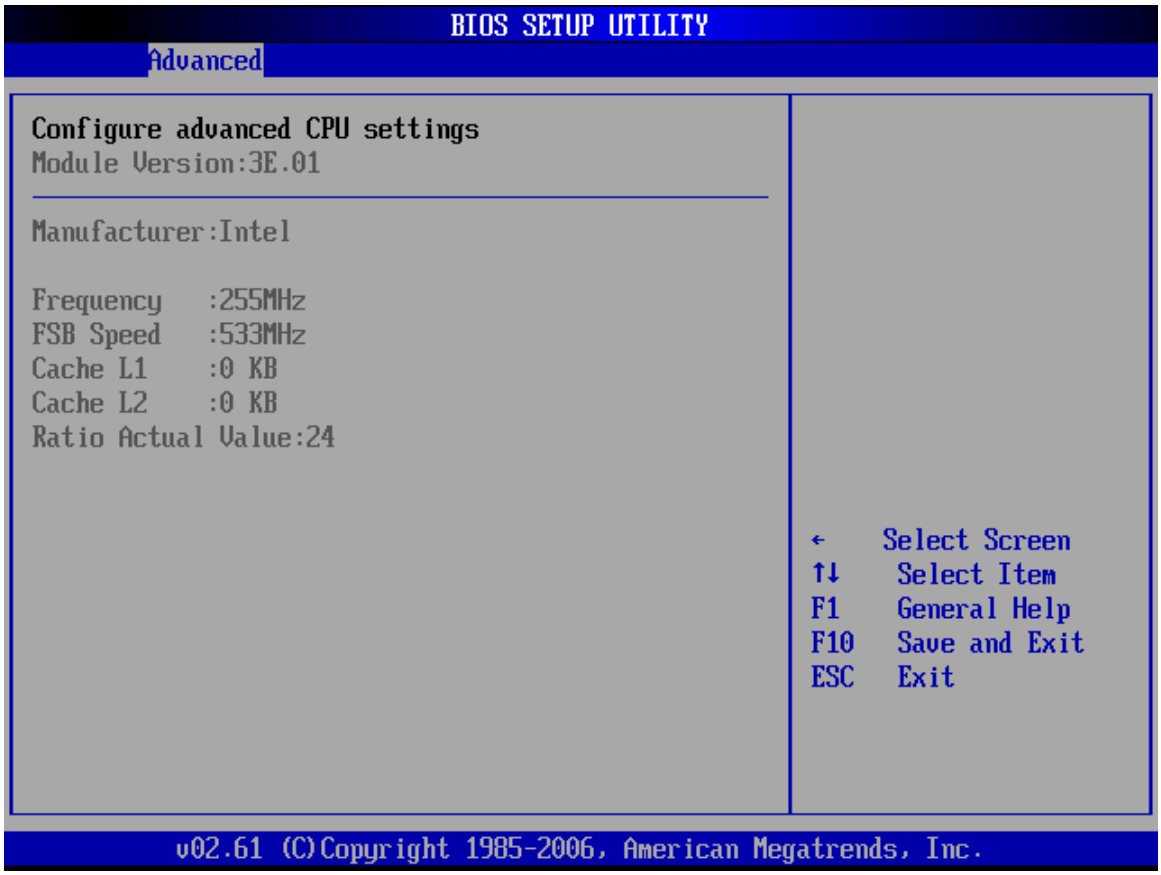
- **AHCI Configuration** (see Section 6.3.6)
- **APM Configuration** (see Section 6.3.7)
- **Remote Access Configuration** (see Section 6.3.8)
- **Trusted Computing** (see Section 6.3.9)
- **USB Configuration** (see Section 6.3.8)



BIOS Menu 2: Advanced

6.3.1 CPU Configuration

Use the **CPU Configuration** menu (BIOS Menu 3) to view detailed CPU specifications and configure the CPU.



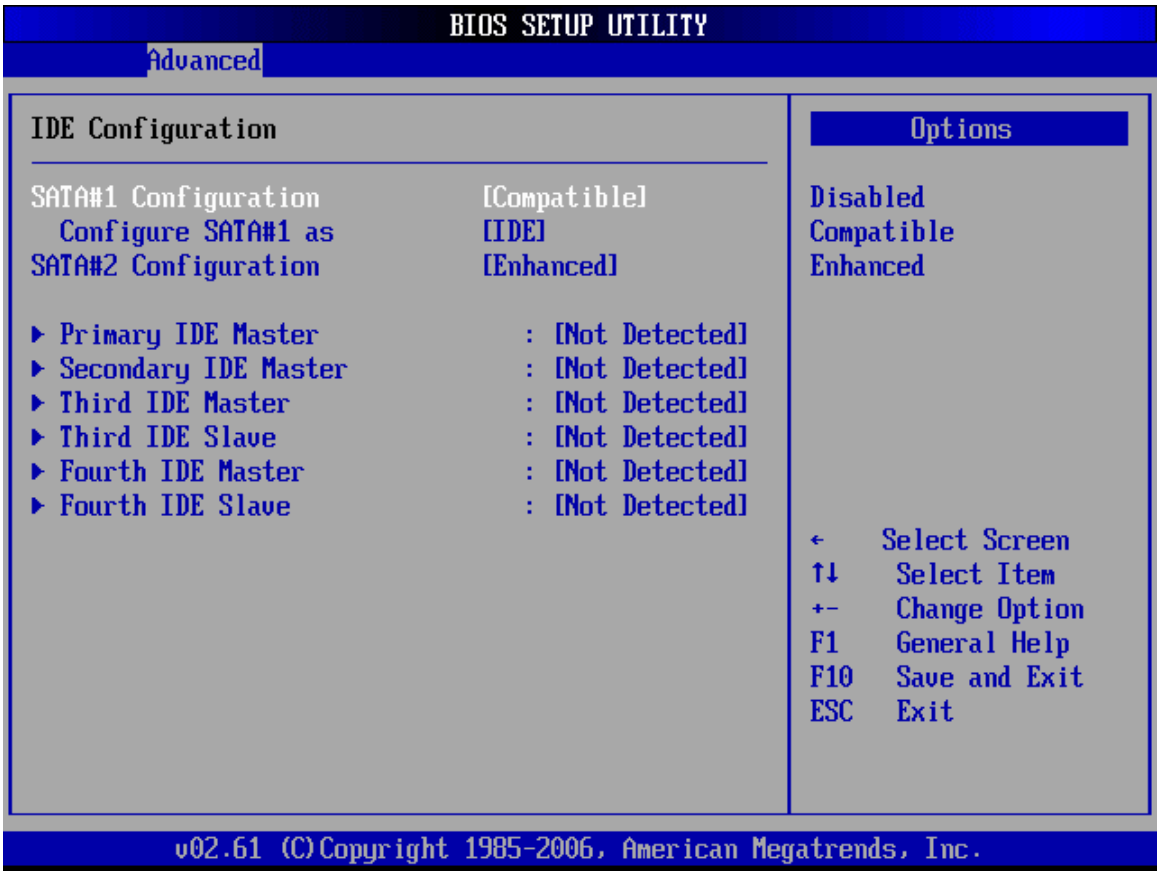
BIOS Menu 3: CPU Configuration

The CPU Configuration menu (BIOS Menu 3) lists the following CPU details:

- **Manufacturer**: Lists the name of the CPU manufacturer
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size
- Ratio Actual Value:

6.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

➔ **SATA#1 Compatible**

Use the **SATA#1 Compatible** BIOS option to select the configuration mode or disable the SATA 1 drive.

➔	**Disabled**		SATA 1 drive is disabled
➔	**Enhanced**	(Default)	SATA 1 drive is in enhanced mode

➔ **Configure SATA#1 as [IDE]**

Use the **Configure SATA#1 as** BIOS option to select the mode for the SATA 1 drive.

➔	**IDE**	(Default)	SATA 1 is configured as an IDE device

➔ **RAID** SATA 1 is configured as an RAID element

➔ **AHCI** SATA 1 is configured as an AHCI device

➔ **SATA#2 Compatible**

Use the **SATA#2 Compatible** BIOS option to select the configuration mode or disable the SATA 2 drive.

➔ **Disabled** SATA 1 drive is disabled

➔ **Enhanced** (Default) SATA 1 drive is in enhanced mode

➔ **IDE Master and IDE Slave**

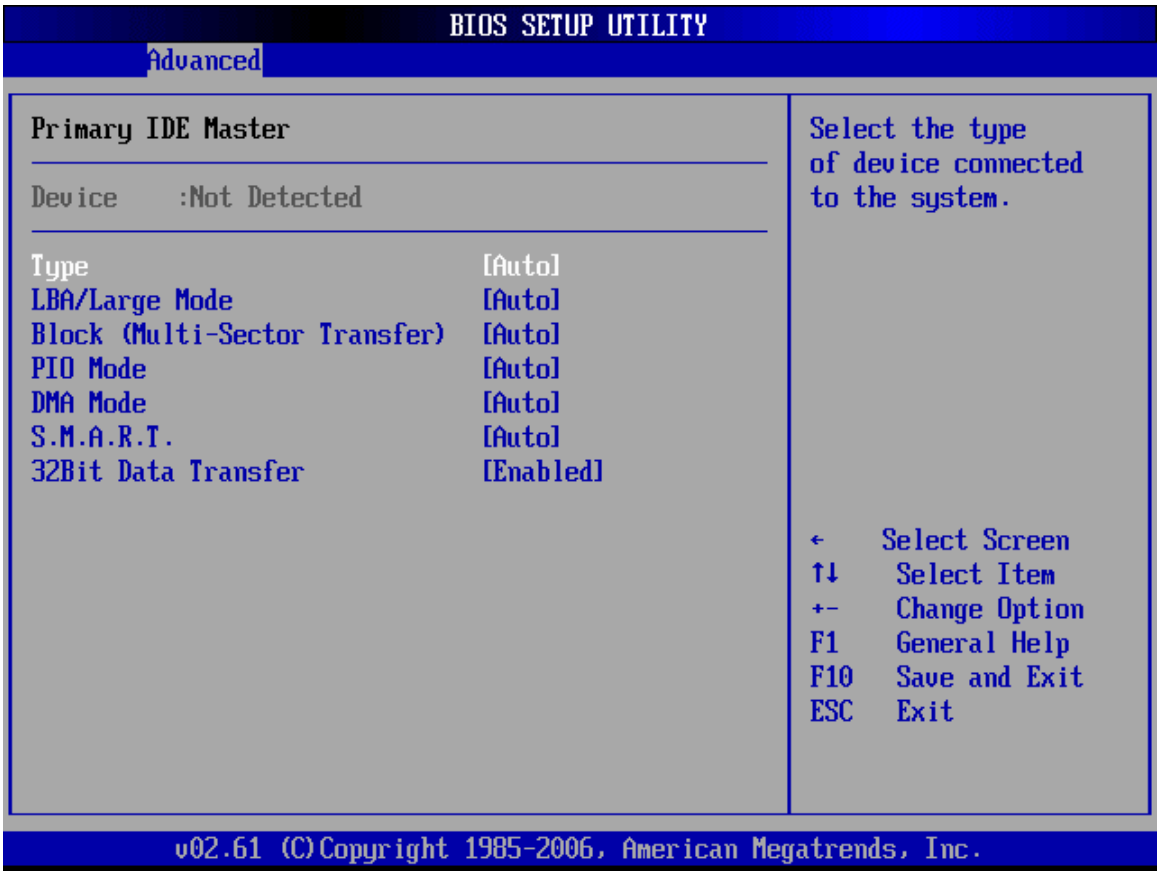
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 6.3.2.1** appear.

6.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The “grayed-out” items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **Vendor**: Lists the device manufacturer
- **Size**: List the storage capacity of the device.
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per

interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.

- **PIO Mode**: Indicates the PIO mode of the installed device.
- **Async DMA**: Indicates the highest Asynchronous DMA Mode that is supported.
- **Ultra DMA**: Indicates the highest Synchronous DMA Mode that is supported.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer**: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed**		BIOS is prevented from searching for an IDE disk drive on the specified channel.
➔ **Auto**	**DEFAULT**	The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
➔ **CD/DVD**		The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
➔ **ARMD**		This option specifies an ATAPI Removable Media Device. These include, but are not limited to: ➔ **ZIP** ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled**		BIOS is prevented from using the LBA mode control on the specified channel.
➔ **Auto**	**DEFAULT**	BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled**		BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
➔ **Auto**	**DEFAULT**	BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto**	**DEFAULT**	BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

➔	**0**	PIO mode 0 selected with a maximum transfer rate of 3.3MBps
➔	**1**	PIO mode 1 selected with a maximum transfer rate of 5.2MBps
➔	**2**	PIO mode 2 selected with a maximum transfer rate of 8.3MBps
➔	**3**	PIO mode 3 selected with a maximum transfer rate of 11.1MBps
➔	**4**	PIO mode 4 selected with a maximum transfer rate of 16.6MBps (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

➔	**Auto**	**DEFAULT**	BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
➔	**SWDMA0**		Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
➔	**SWDMA1**		Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
➔	**SWDMA2**		Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
➔	**MWDMA0**		Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps
➔	**MWDMA1**		Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps
➔	**MWDMA2**		Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps

➔	**UDMA1**	Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps
➔	**UDMA1**	Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps
➔	**UDMA2**	Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
➔	**UDMA3**	Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔	**UDMA4**	Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔	**UDMA5**	Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔	**Auto**	**DEFAULT**	BIOS auto detects HDD SMART support.
➔	**Disabled**		Prevents BIOS from using the HDD SMART feature.
➔	**Enabled**		Allows BIOS to use the HDD SMART feature

➔ **32Bit Data Transfer [Enabled]**

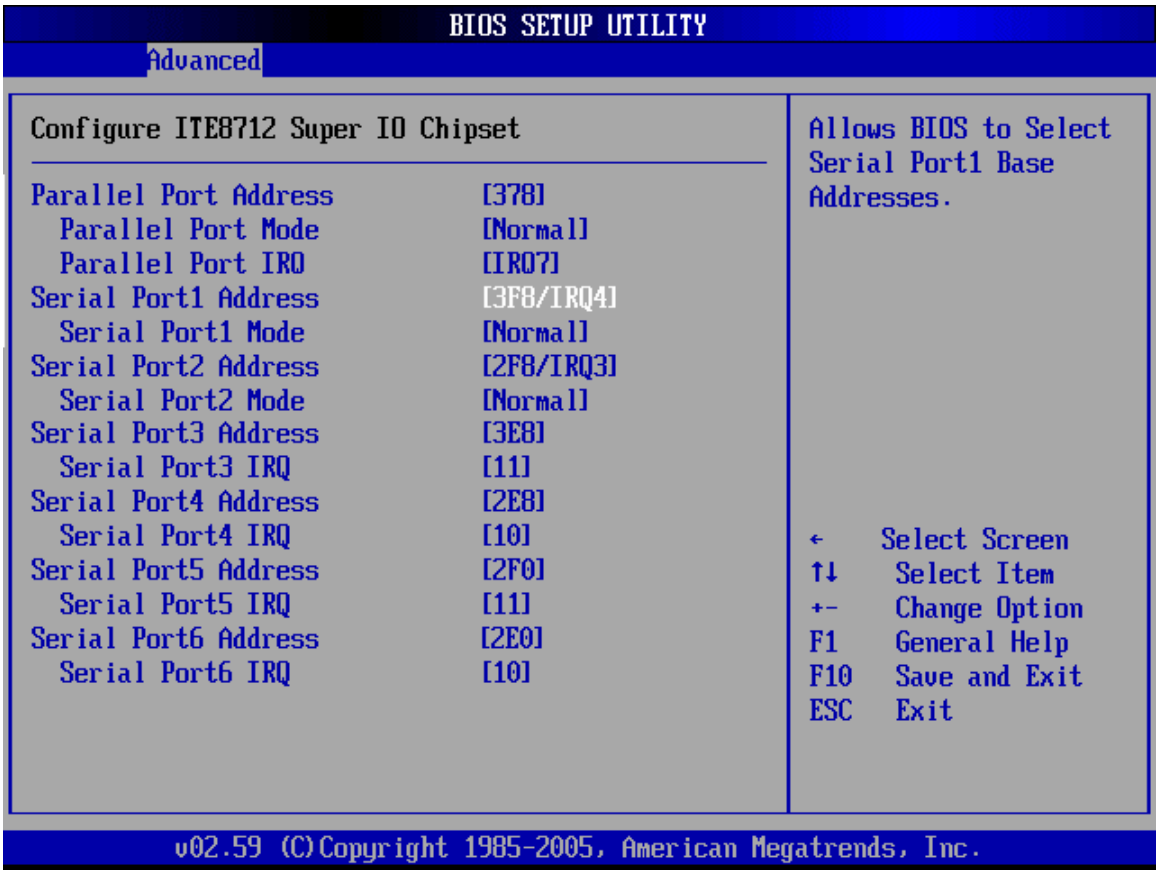
Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.

➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

6.3.3 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 6**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 6: Super IO Configuration

➔ **Parallel Address [378]**

The **Parallel Port Address** BIOS option assigns the I/O port address of the parallel port. The following address options are available:

➔ **Disabled**		No I/O port address is assigned to the parallel port
➔ **378**	(Default)	Parallel Port I/O port address is 378
➔ **278**		Parallel Port I/O port address is 278
➔ **3BC**		Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

The Parallel Port Mode selection selects the mode the parallel port operates in.

➔ **Normal**	(DEFAULT)	The normal parallel port mode is the standard mode for parallel port operation.
EPP		The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.
➔ **ECP**		The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the SPP mode.
➔ **EPP + ECP**		The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster

than the Normal mode

The parallel port becomes compatible with EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

The **Parallel Port Address** BIOS option assigns the parallel port interrupt address. The following address options are available.

➔ **IRQ5**		Parallel port interrupt address is IRQ5
➔ **IRQ7**	(Default)	Parallel port interrupt address is IRQ7

➔ **Serial Port1 Address [3F8/IRQ4]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8/IRQ4**	**DEFAULT**	Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
➔ **3E8/IRQ4**		Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8/IRQ3**	**DEFAULT**	Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3

➔ **3E8/IRQ4**		Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [Normal]**

Use the **Serial Port2 Mode** option to select the Serial Port2 operational mode.

➔ **Normal**	**DEFAULT**	Serial Port 2 mode is normal
➔ **IrDA**		Serial Port 2 mode is IrDA
➔ **ASK IR**		Serial Port 2 mode is ASK IR

➔ **Serial Port3 Address [3E8]**

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

➔ **Disabled**		No base address is assigned to serial port 3
➔ **3E8**	**DEFAULT**	Serial port 3 I/O port address is 3E8
➔ **2E8**		Serial port 3 I/O port address is 2E8
➔ **2F0**		Serial port 3 I/O port address is 2F0
➔ **2E0**		Serial port 3 I/O port address is 2E0

➔ **Serial Port3 IRQ [11]**

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

➔ **4**	Serial port 3 IRQ address is 4
➔ **9**	Serial port 3 IRQ address is 9

➔ **10**		Serial port 3 IRQ address is 10
➔ **11**	**DEFAULT**	Serial port 3 IRQ address is 11

➔ **Serial Port4 Address [2E8]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

➔ **Disabled**		No base address is assigned to serial port 3
➔ **3E8**		Serial port 4 I/O port address is 3E8
➔ **2E8**	**DEFAULT**	Serial port 4 I/O port address is 2E8
➔ **2F0**		Serial port 4 I/O port address is 2F0
➔ **2E0**		Serial port 4 I/O port address is 2E0

➔ **Serial Port4 IRQ [10]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

➔ **3**	**DEFAULT**	Serial port 4 IRQ address is 3
➔ **9**		Serial port 4 IRQ address is 9
➔ **10**	**DEFAULT**	Serial port 4 IRQ address is 10
➔ **11**		Serial port 4 IRQ address is 11

➔ **Serial Port5 Address [2E0]**

Use the **Serial Port5 IRQ** option to select the interrupt address for serial port 5.

➔ **Disabled**		No base address is assigned to serial port 5
➔ **3E8**		Serial port 6 I/O port address is 3E8
➔ **2E8**		Serial port 6 I/O port address is 2E8

➔ **2F0** **DEFAULT** Serial port 6I/O port address is 2F0

➔ **2E0** Serial port 6 I/O port address is 2E8

➔ Serial Port5 IRQ [11]

Use the **Serial Port5 IRQ** option to select the interrupt address for serial port 5.

➔ **10** Serial port 5 IRQ address is 10

➔ **11** **DEFAULT** Serial port 5 IRQ address is 11

➔ Serial Port6 Address [2D8]

Use the **Serial Port6 IRQ** option to select the interrupt address for serial port 6.

➔ **Disabled** No base address is assigned to serial port 6

➔ **3E8** Serial port 6 I/O port address is 3E8

➔ **2E8** Serial port 6 I/O port address is 2E8

➔ **2F0** Serial port 6I/O port address is 2F0

➔ **2E0** **DEFAULT** Serial port 6 I/O port address is 2E8

➔ Serial Port6 IRQ [10]

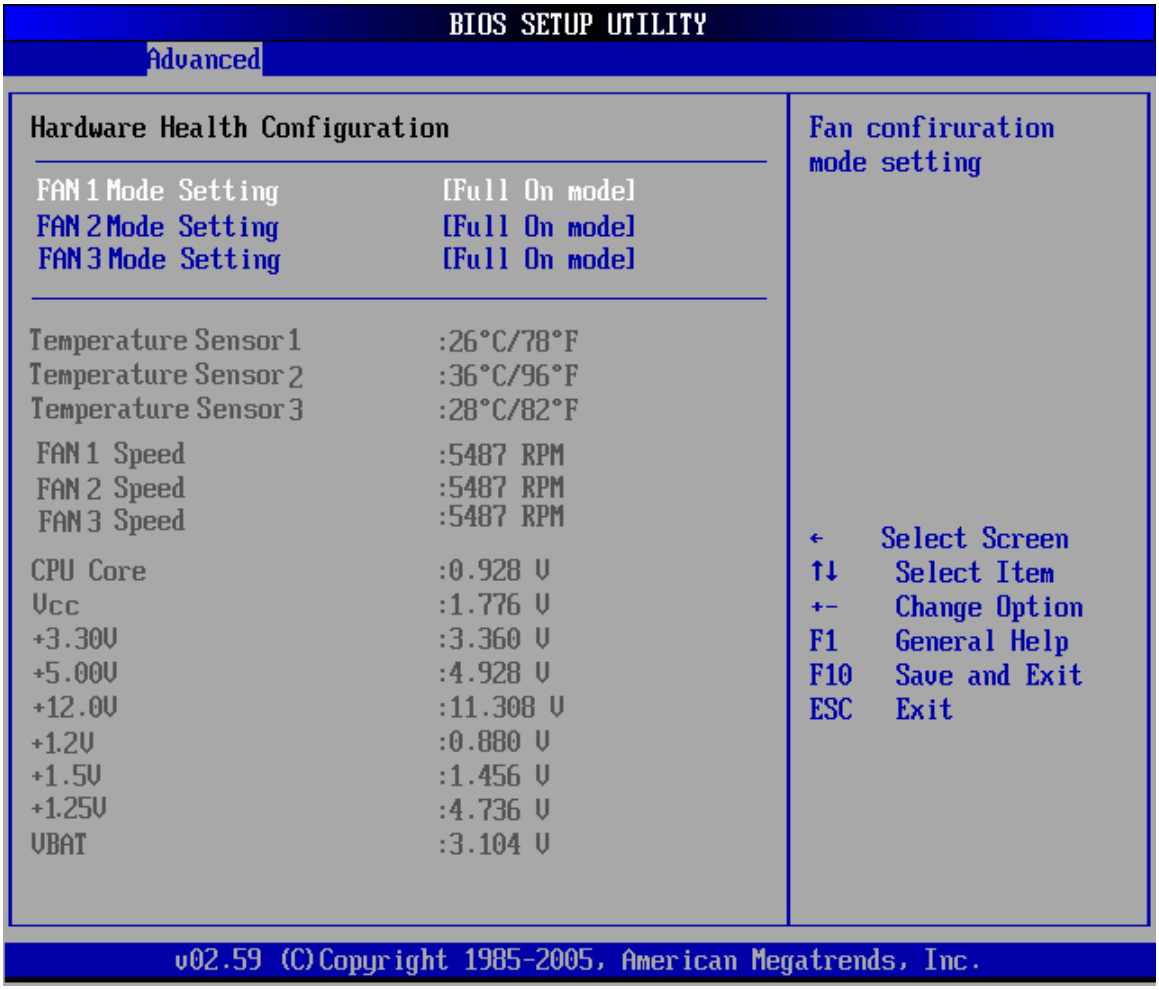
Use the **Serial Port6 IRQ** option to select the interrupt address for serial port 6.

➔ **10** **DEFAULT** Serial port 6 IRQ address is 10

➔ **11** Serial port 6 IRQ address is 11

6.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 7: Hardware Health Configuration

➔FAN n Mode Setting [Full On Mode]

Use the **FAN Mode n Setting** option to configure the second fan.

➔	**Full On Mode**	**DEFAULT**	Fan is on all the time
➔	**Automatic mode**		Fan is off when the temperature is low

enough. Parameters must be set by the user.

➔ **PWM Manual mode** Pulse width modulation set manually

When the **FAN Mode n Setting** option is in the **Automatic Mode**, the following parameters can be set.

- Temperature n Limit of OFF
- Temperature n Limit of Start
- Fan n Start PWM
- Slope PWM n

When the **FAN Mode n Setting** option is in the **PWM Manual Mode**, the following parameters can be set.

- Fan n PWM control

➔ Temperature n Limit of OFF [000]

WARNING:

Setting this value too high may cause the fan to stop when the CPU is at a high temperature and therefore cause the system to be damaged.

The **Temperature n Limit of OFF** option can only be set if the **FAN Mode n Setting** option is set to **Automatic Mode**. Use the **Temperature n Limit of OFF** option to select the CPU temperature at which the cooling fan should automatically turn off. To select a value, select the **Temperature n Limit of OFF** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C
-

➔ **Temperature n Limit of Start [020]**

WARNING:

Setting this value too high may cause the fan to start only when the CPU is at a high temperature and therefore cause the system to be damaged.

The **Temperature n Limit of Start** option can only be set if the **FAN Mode n Setting** option is set to **Automatic Mode**. Use the **Temperature n Limit of Start** option to select the CPU temperature at which the cooling fan should automatically turn on. When the fan starts, it rotates using the starting pulse width modulation (PWM) specified in the **Fan n Start PWM** option below. To select a value, select the **Temperature n Limit of Start** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

➔ **Fan n Start PWM [070]**

The **Fan n Start PWM** option can only be set if the **FAN Mode n Setting** option is set to **Automatic Mode**. Use the **Fan n Start PWM** option to select the PWM mode the fan starts to rotate with after the temperature specified in the **Temperature n Limit of Start** is exceeded. The Super I/O chipset supports 128 PWM modes. To select a value, select the **Fan n Start PWM** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- PWM Minimum Mode: 0
- PWM Maximum Mode: 127

➔ **Slope PWM n [0.5 PWM]**

The **Slope PWM n** option can only be set if the **FAN Mode n Setting** option is set to **Automatic Mode**. Use the **Slope PWM n** option to select the linear rate at which the PWM mode increases with respect to an increase in temperature. A list of available options is shown below:

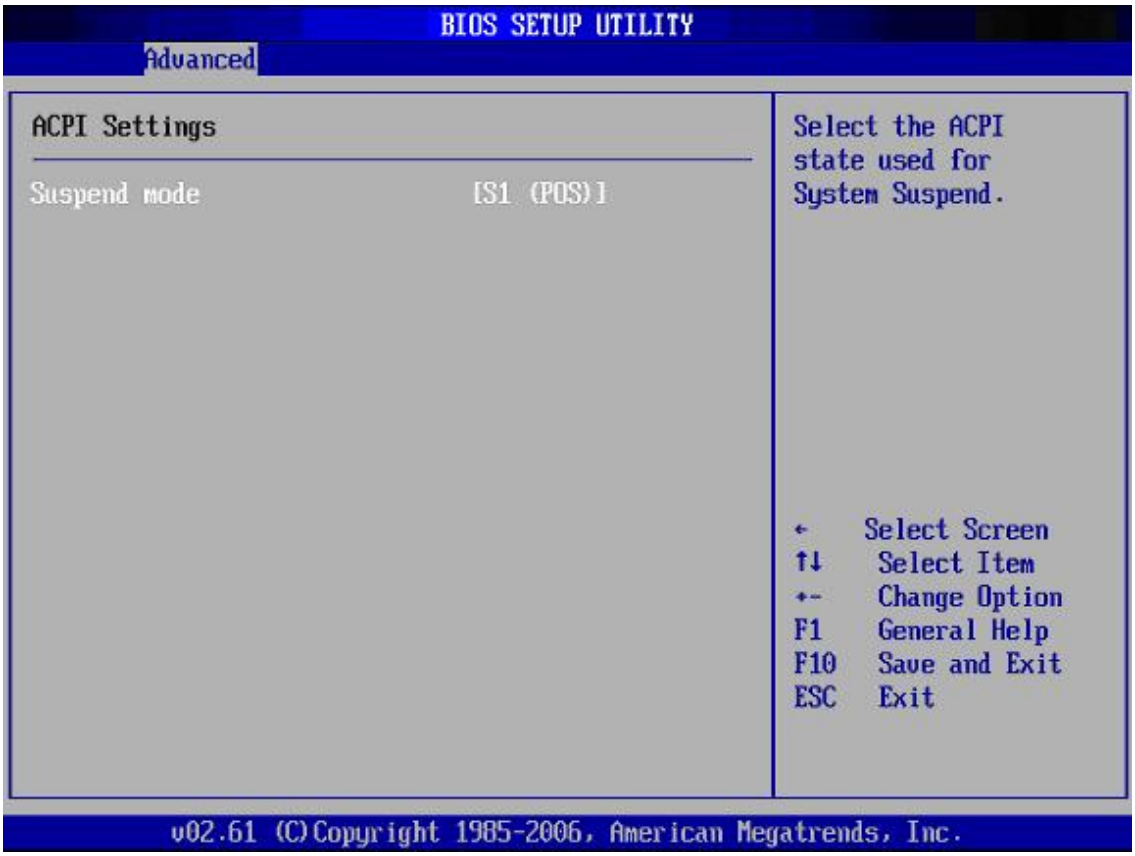
- 0.125 PWM
- 0.25 PWM
- 0.5 PWM
- 1 PWM
- 2 PWM
- 4 PWM
- 8 PWM
- 15 PWM

The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - Temperature Sensor #1
  - Temperature Sensor #2
  - Temperature Sensor #3
- **Fan Speeds**: The CPU cooling fan speed is monitored.
  - Fan1 Speed
  - Fan2 Speed
  - Fan3 Speed
- **Voltages**: The following system voltages are monitored
  - CPU Core
  - Vcc
  - +3.30V
  - +5.00V
  - +12.0V
  - +1.2V
  - +1.5V
  - +1.25V
  - VBAT

6.3.5 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 8**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 8: ACPI Configuration

➔ **Suspend Mode [S1(POS)]**

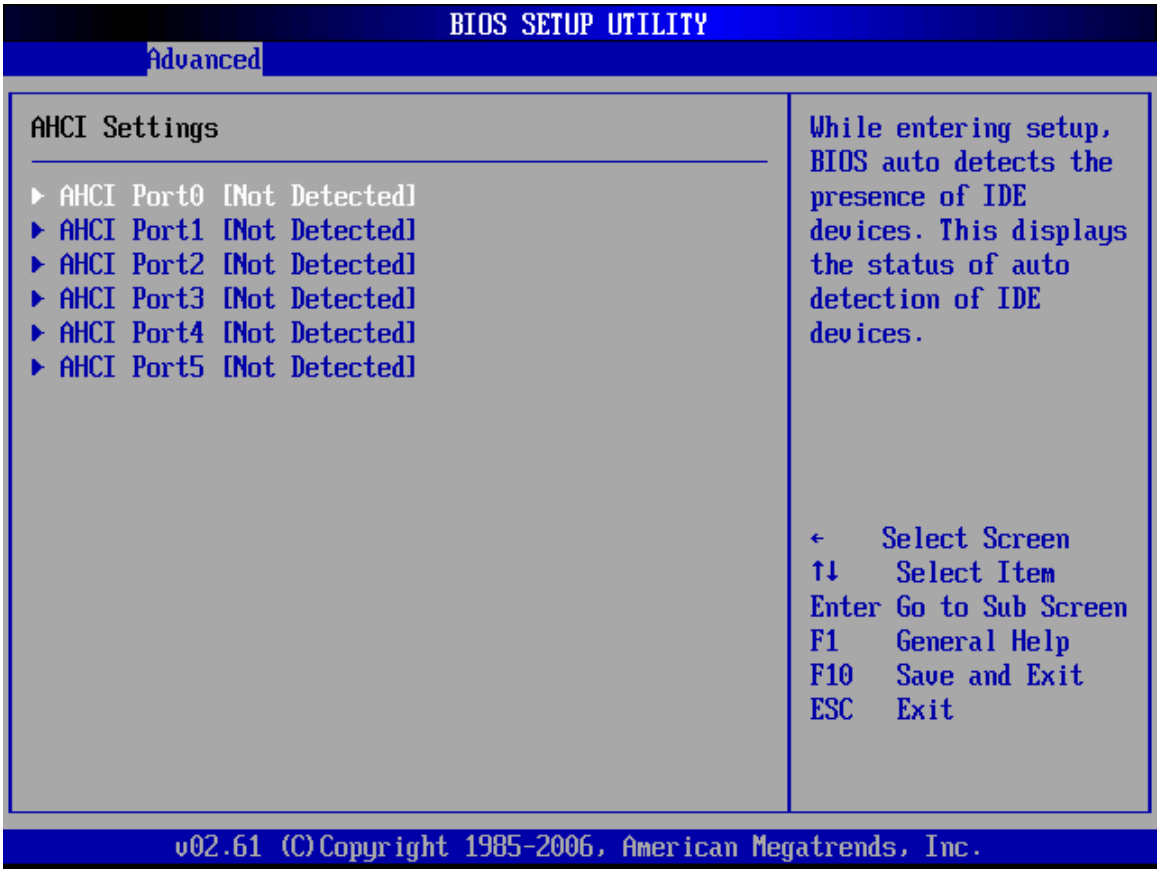
The **Suspend Mode** BIOS option specifies the sleep state your system will enter when it is not being used.

➔ **S1 (POS)** (Default) System appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (STR)** System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

6.3.6 AHCI Configuration

The **AHCI Settings** menu reports on the auto-detection of IDE devices connected to the system.


BIOS SETUP UTILITY
Advanced
AHCI Settings
AHCI Port0 [Not Detected]
AHCI Port1 [Not Detected]
AHCI Port2 [Not Detected]
AHCI Port3 [Not Detected]
AHCI Port4 [Not Detected]
AHCI Port5 [Not Detected]
While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.

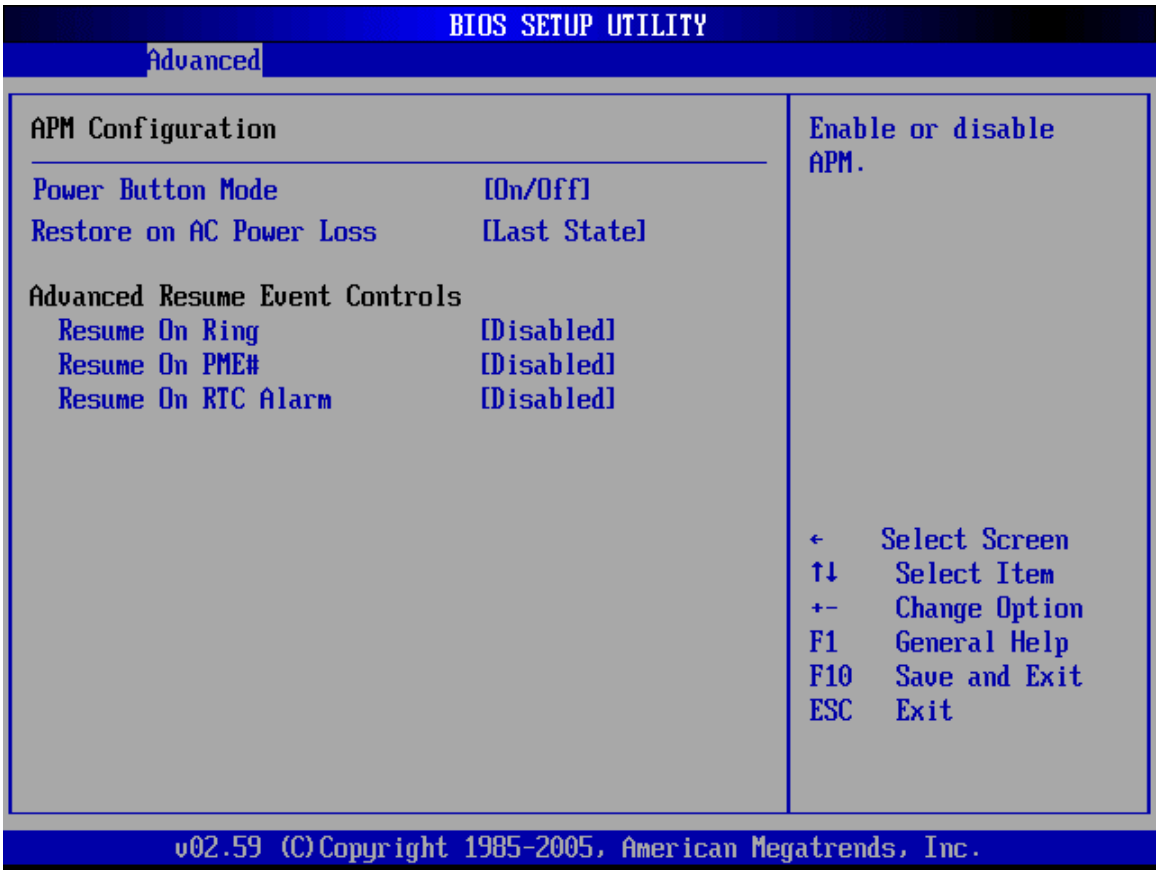
BIOS Menu 9: AHCI Configuration

➔ **AHCI Port n [Not Detected]**

Use the **AHCI Port n** BIOS option to check what AHCI (Advanced Host Controller Interface) devices are detected by the system. This option displays the status of the auto detection of IDE devices.

6.3.7 APM Configuration

The APM Configuration menu (BIOS Menu 10) allows the advanced power management options to be configured.



BIOS Menu 10:Advanced Power Management Configuration

➔ **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

➔ **On/Off** (Default) When the power button is pressed the system is either turned on or off

➔ **Suspend** When the power button is pressed the system goes into suspend mode

➔ Restore on AC Power Loss [Power Off]

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔	**Power Off**	(Default)	The system remains turned off
➔	**Power On**		The system turns on
➔	**Last State**		The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ Resume on Ring [Disabled]

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

➔	**Disabled**	(Default)	Wake event not generated by an incoming call
➔	**Enabled**		Wake event generated by an incoming call

➔ Resume on PME# [Disabled]

Use the **Resume on PME#** BIOS option to enable activity on the PCI PME (power management event) controller to rouse the system from a suspend or standby state.

➔	**Disabled**	(Default)	Wake event not generated by PCI PME controller activity
➔	**Enabled**		Wake event generated by PCI PME controller activity

➔ Resume On RTC Alarm [Disabled]

Use the **Resume On RTC Alarm** to specify when the computer is roused from a suspended state.

➔ **Disabled** (Default) The real time clock (RTC) cannot generate a wake event

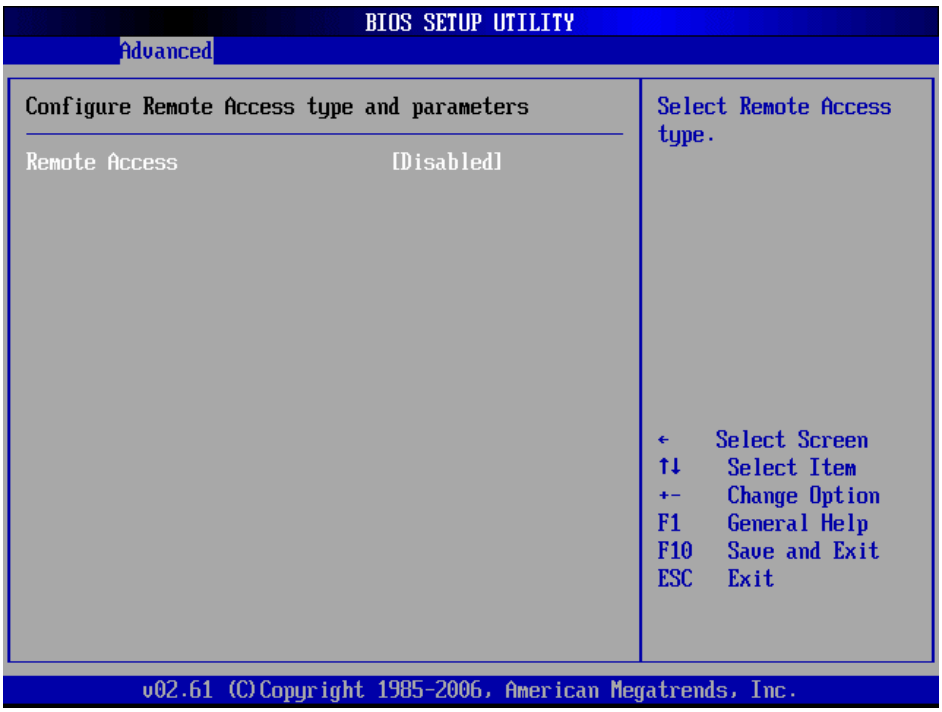
➔ **Enabled** If selected, the following will appear with values that can be selected:

- ➔ **RTC Alarm Date (Days)**
- ➔ **System Time**

After setting the alarm, the computer will turn itself on from a suspend state when the alarm goes off.

6.3.8 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 11**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 11: Remote Access Configuration [Advanced]

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled**	**DEFAULT**	Remote access is disabled.
➔ **Enabled**		Remote access configuration options shown below appear:

- ➔ **Serial Port Number**
- ➔ **Serial Port Mode**
- ➔ **Flow Control**
- ➔ **Redirection after BIOS POST**
- ➔ **Terminal Type**
- ➔ **VT-UTF8 Combo Key Support**
- ➔ **Sredir Memory Display Delay**

These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

Use the **Serial Port Number** option to select the serial port used for remote access.

➔ **COM1**	**DEFAULT**	System is remotely accessed through COM1
➔ **COM2**		System is remotely accessed through COM2
➔ **COM3**		System is remotely accessed through COM3
➔ **COM4**		System is remotely accessed through COM4

➔ **COM5** System is remotely accessed through COM5

➔ **COM6** System is remotely accessed through COM6

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [3F8h,4]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

➔ **Flow Control [None]**

Use the **Flow Control** option to report the flow control method for the console redirection application.

➔ **None** **DEFAULT** No control flow,

➔ **Hardware**		Hardware is set as the console redirection
➔ **Software**		Software is set as the console redirection

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔ **Disabled**		The console is not redirected after POST
➔ **Boot Loader**		Redirection is active during POST and during Boot Loader
➔ **Always**	**DEFAULT**	Redirection is always active (Some OSes may not work if set to Always)

➔ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

➔ **ANSI**	**DEFAULT**	The target terminal type is ANSI
➔ **VT100**		The target terminal type is VT100
➔ **VT-UTF8**		The target terminal type is VT-UTF8

➔ **VT-UTF8 Combo Key Support [Disabled]**

Use the **VT-UFT8 Combo Key Support** option to enable additional keys that are not provided by VT100 for the PC 101 keyboard.

The VT100 Terminal Definition is the standard convention used to configure and conduct emergency management tasks with UNIX-based servers. VT100 does not support all keys on the standard PC 101-key layout, however. The VT-UTF8 convention makes available additional keys that are not provided by VT100 for the PC 101 keyboard.

➔ **Disabled** Disables the VT-UTF8 terminal keys

➔ **Enabled** **DEFAULT** Enables the VT-UTF8 combination key. Support for ANSI/VT100 terminals

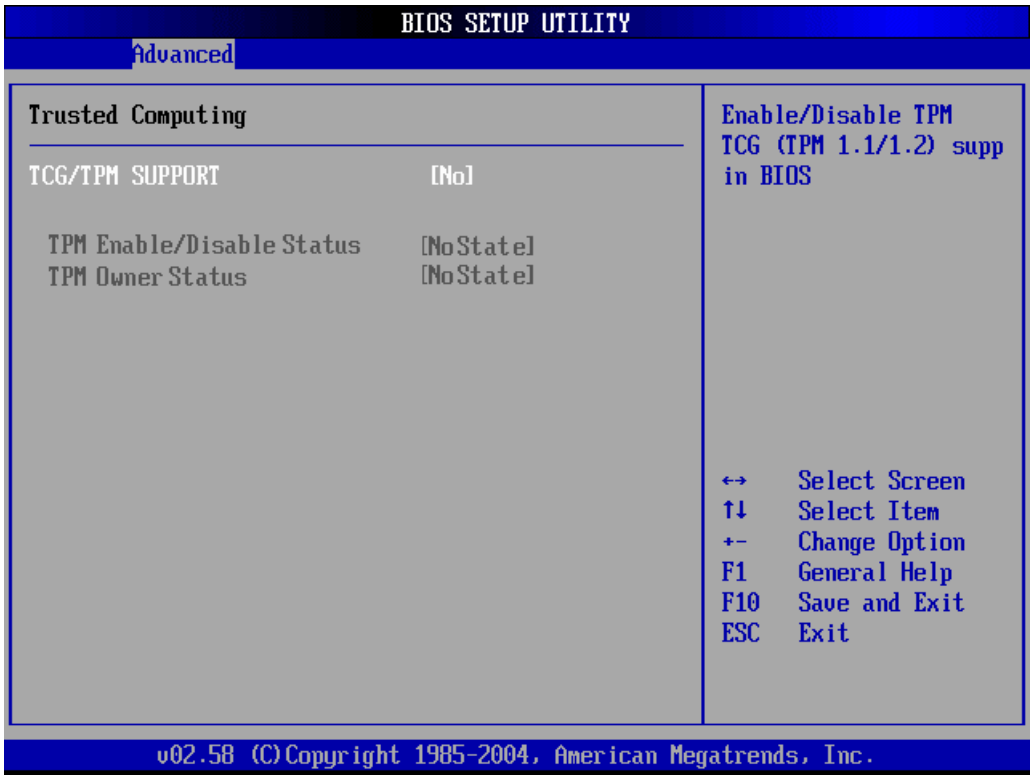
➔ **Sredir Memory Display Delay [Disabled]**

Use the **Sredir Memory Display Delay** option to select the delay before memory information is displayed. Configuration options are listed below

- No Delay **DEFAULT**
- Delay 1 sec
- Delay 2 sec
- Delay 4 sec

6.3.9 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 12**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 12: Trusted Computing

➔ TCG/TPM Support [Yes]

Use the **TCG/TPM Support** option to configure support for the TPM.

➔ **No** **DEFAULT** TPM support is disabled.

➔ **Yes** TPM support is enabled.

➔ TPM Enable/Disable Status [No State]

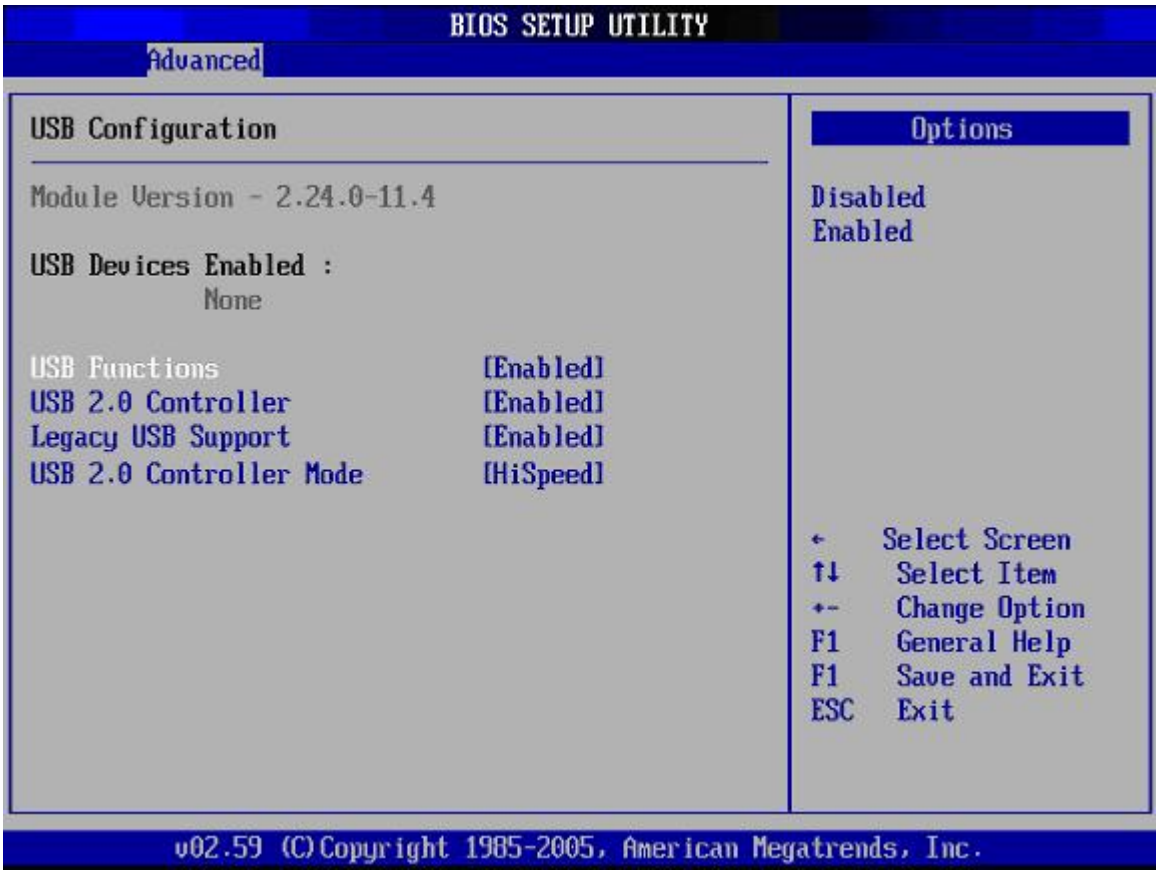
Use the **TPM Enable/Disable Status** to see if the TPM module has been enabled or disabled.

➔ TPM Owner Status [No State]

Use the **TPM Owner Status** to see if the owner status of the TPM module.

6.3.10 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 13**) to read USB configuration information and configure the USB settings.



BIOS Menu 13: USB Configuration

➔ **USB Functions [Enabled]**

Use the **USB Function** BIOS option to enable or disable USB function support.

➔	**Disabled**		USB function support disabled
➔	**Enabled**	**DEFAULT**	USB function support enabled

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

➔ **Disabled**		USB 2.0 controller disabled
➔ **Enabled**	**DEFAULT**	USB 2.0 controller enabled

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled**		Legacy USB support disabled
➔ **Enabled**	**DEFAULT**	Legacy USB support enabled
➔ **Auto**		Legacy USB support disabled if no USB devices are connected

➔ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

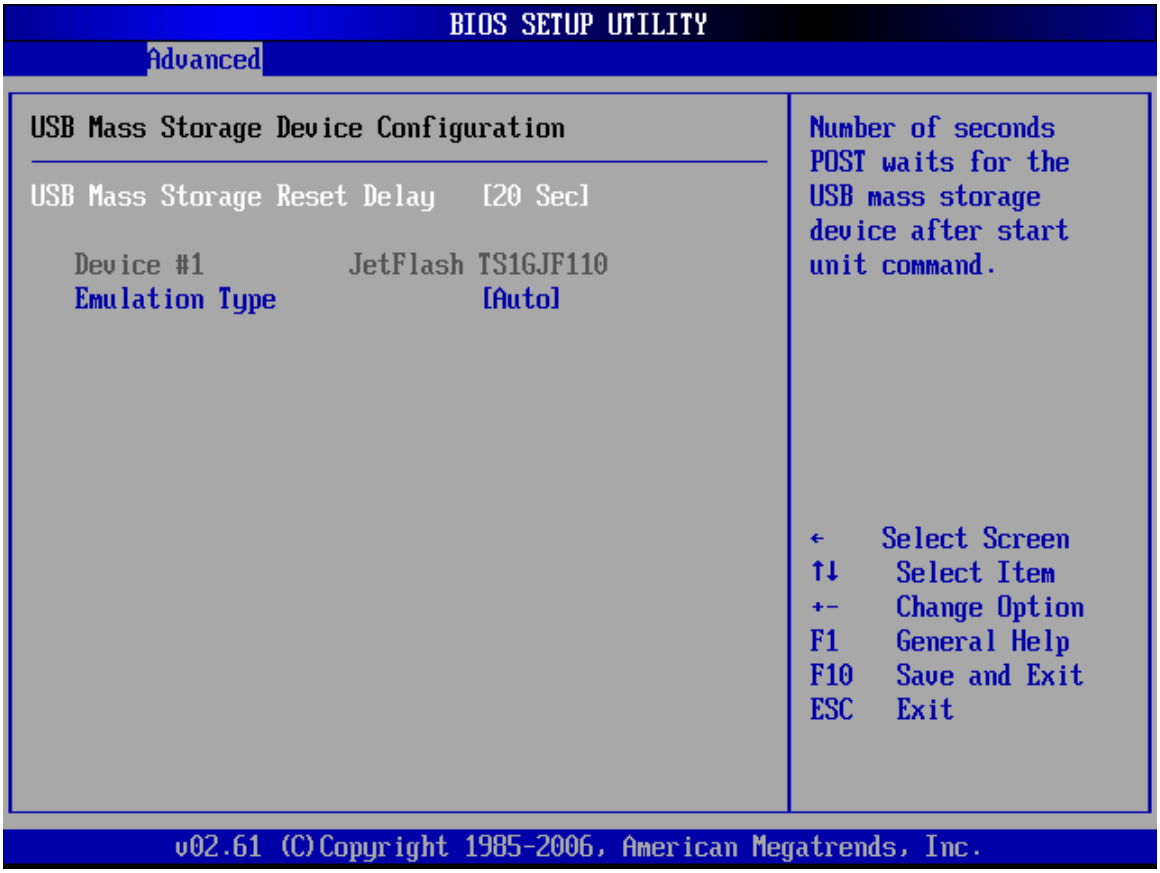
➔ **FullSpeed**		The controller is capable of operating at 12Mb/s
➔ **HiSpeed**	**DEFAULT**	The controller is capable of operating at 480Mb/s

6.3.10.1 USB Mass Storage Device Configuration

Note:

This option is only available if a USB drive is inserted into the USB port.

Use the USB Mass Storage Device Configuration menu (BIOS Menu 14) to configure USB mass storage class devices.


BIOS SETUP UTILITY
Advanced
USB Mass Storage Device Configuration
USB Mass Storage Reset Delay [20 Sec]
Device #1 JetFlash TS1GJF110
Emulation Type [Auto]
Number of seconds POST waits for the USB mass storage device after start unit command.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 14: USB Mass Storage Device Configuration

➔ **USB Mass Storage Reset Delay [20 Sec]**

Use the **USB Mass Storage Reset Delay** option to set the number of seconds POST waits for the USB mass storage device after the start unit command.

➔ **10 Sec** POST waits 10 seconds for the USB mass storage device after the start unit command.

➔ **20 Sec** **DEFAULT** POST waits 20 seconds for the USB mass storage device after the start unit command.

➔ **30 Sec** POST waits 30 seconds for the USB mass storage device after the start unit command.

➔ **40 Sec** POST waits 40 seconds for the USB mass storage device after the start unit command.

➔ **Device ##**

The **Device##** field lists the USB devices that are connected to the system.

➔ **Emulation Type [Auto]**

Use the **Emulation Type** BIOS option to specify the type of emulation BIOS has to provide for the USB device.

NOTE:

Please note that the device's formatted type and the emulation type provided by the BIOS must match for a device to boot properly. If both types do not match then device's behavior is undefined. To make sure both types match, format the device using BIOS INT13h calls after selecting the proper emulation option in BIOS setup. The FORMAT utility provided by Microsoft® MS-DOS®, Microsoft® Windows® 95, and Microsoft® Windows® 98 can be used for this purpose.

➔ **Auto** **DEFAULT** BIOS auto-detects the current USB.

➔ **Floppy** The USB device will be emulated as a floppy drive. The device can be either A: or B: responding to INT13h calls that return DL = 0 or DL = 1 respectively.

➔ **Forced FDD** Allows a hard disk image to be connected as a

floppy image. This option works only for drives formatted with FAT12, FAT16 or FAT32.

➔ **Hard Disk**

Allows the USB device to be emulated as hard disk responding to INT13h calls that return DL values of 80h or above.

➔ **CDROM**

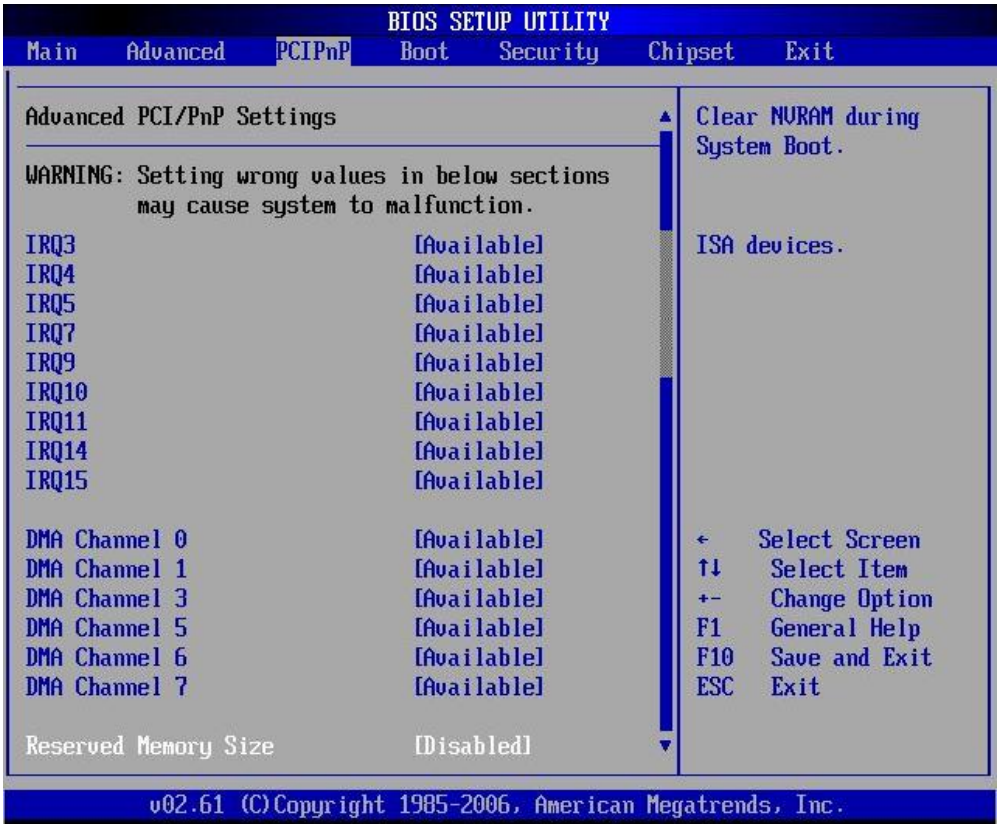
Assumes the CD-ROM is formatted as bootable media. All the devices that support block sizes greater than 512 bytes can only be booted using this option.

6.4 PCI/PnP

Use the PCI/PnP menu (BIOS Menu 15) to configure advanced PCI and PnP settings.

WARNING:

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.



BIOS Menu 15: PCI/PnP Configuration

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available**	**DEFAULT**	The specified IRQ is available to be used by PCI/PnP devices
➔ **Reserved**		The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4

- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available**	**DEFAULT**	The specified DMA is available to be used by PCI/PnP devices
➔ **Reserved**		The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

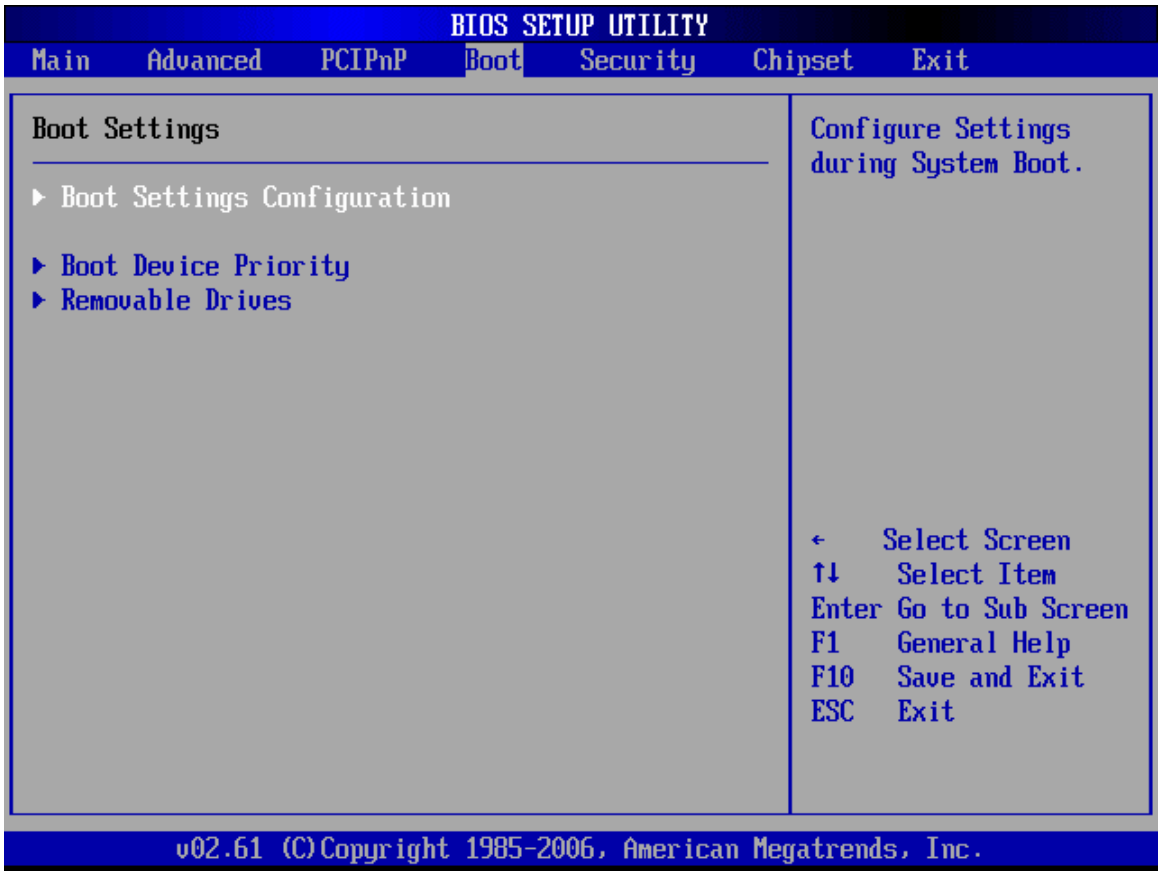
➔ **Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔ **16K**		16KB reserved for legacy ISA devices

➔ **32K** 32KB reserved for legacy ISA devices

➔ **64K** 54KB reserved for legacy ISA devices

6.5 Boot

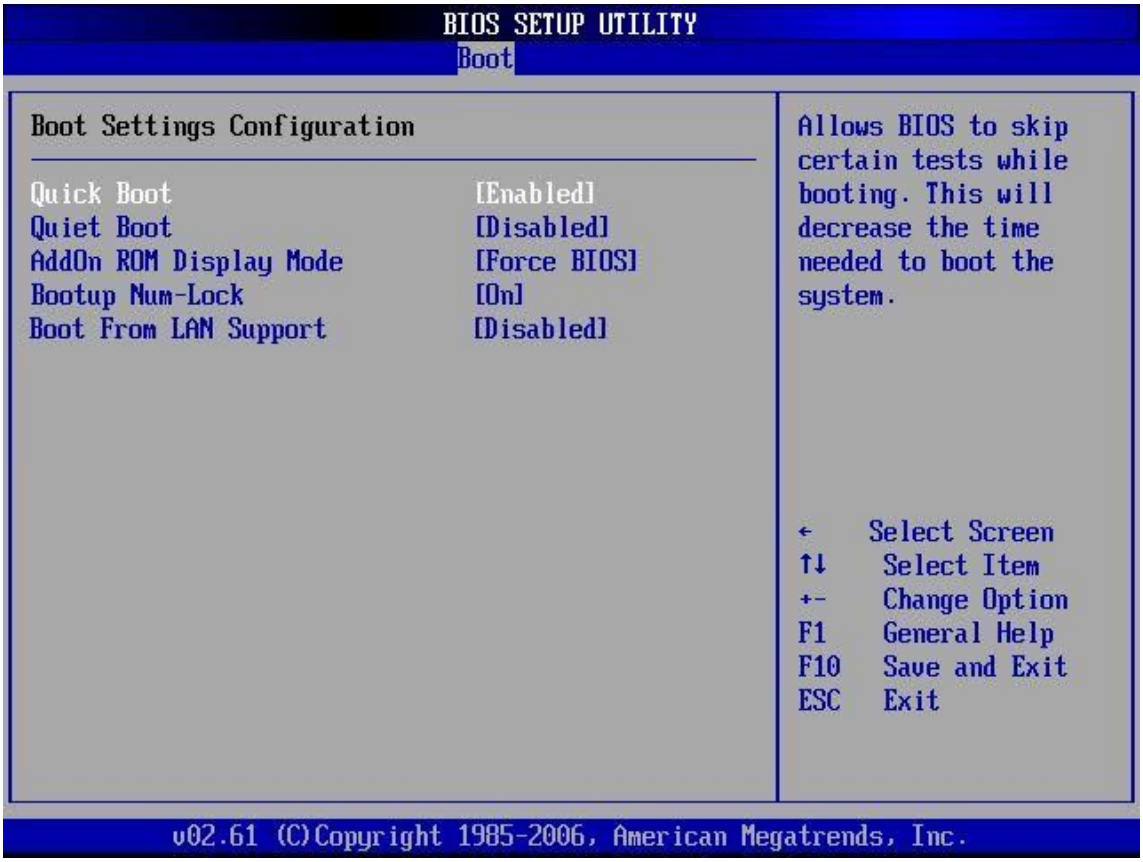
Use the Boot menu (BIOS Menu 16) to configure system boot options.



BIOS Menu 16: Boot

6.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (BIOS Menu 16) to configure advanced system boot options.


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
Boot From LAN Support [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 17: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔	**Disabled**		No POST procedures are skipped
➔	**Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔	**Disabled**	**DEFAULT**	Normal POST messages displayed

➔ **Enabled** OEM Logo displayed instead of POST messages

➔ AddOn ROM Display Mode [Force BIOS]

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS** **DEFAULT** The system forces third party BIOS to display during system boot.

➔ **Keep Current** The system displays normal information during system boot.

➔ Bootup Num-Lock [On]

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ Boot From LAN Support [Disabled]

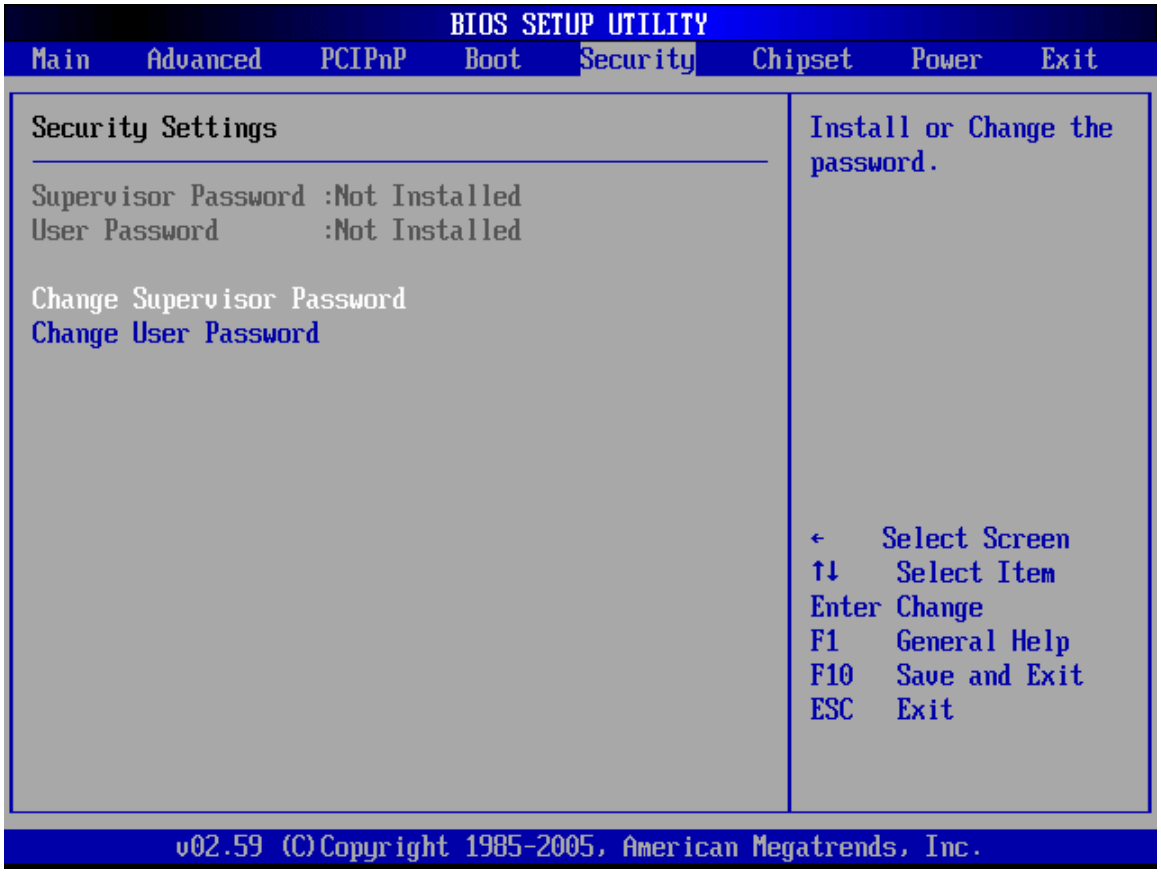
Use the **BOOT From LAN Support** option to enable the system to be booted from a remote system.

➔ **Disabled** (Default) Cannot be booted from a remote system through the LAN

➔ **Enabled** (Default) Can be booted from a remote system through the LAN

6.6 Security

Use the Security menu (BIOS Menu 18) to set system and user passwords.



BIOS Menu 18: Security

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select

this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

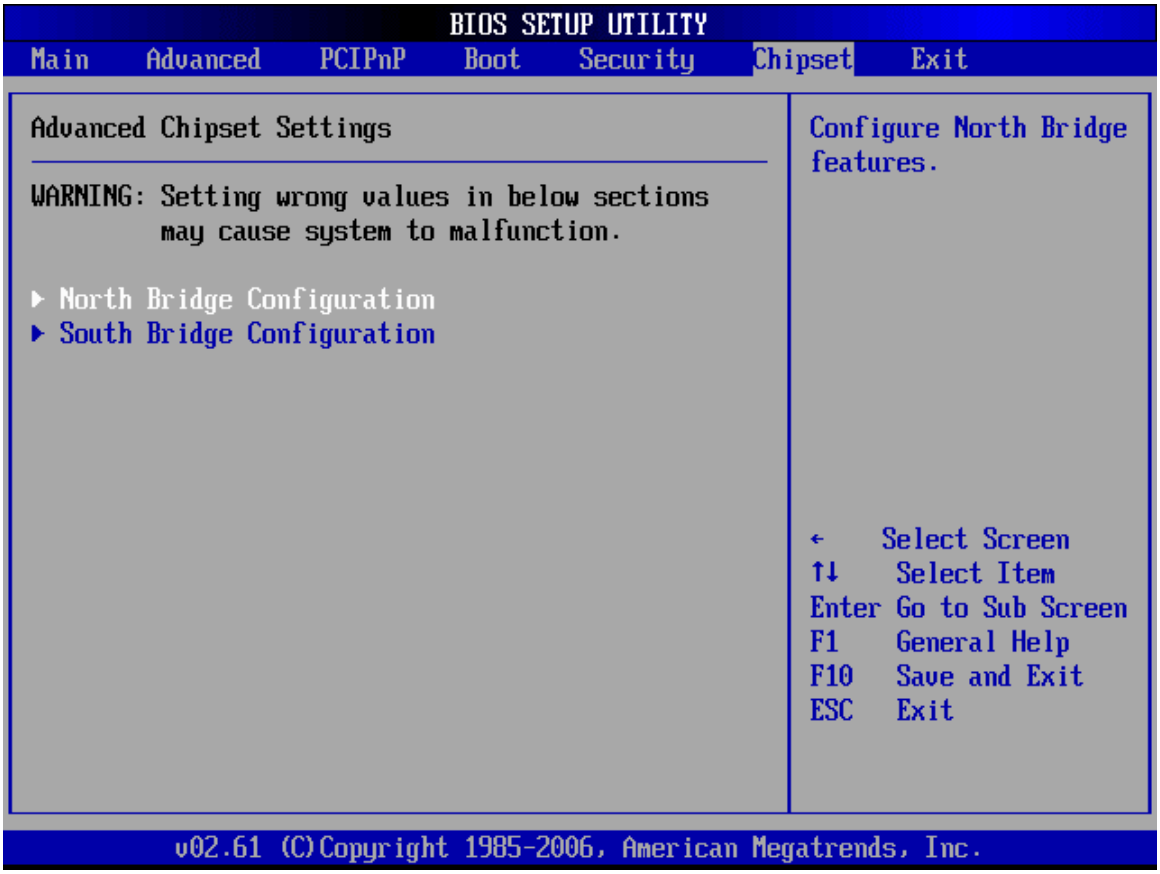
Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

6.7 Chipset

Use the **Chipset** menu (**BIOS Menu 19**) to access the NorthBridge and SouthBridge configuration menus

WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below sections
may cause system to malfunction.
North Bridge Configuration
South Bridge Configuration
Configure North Bridge features.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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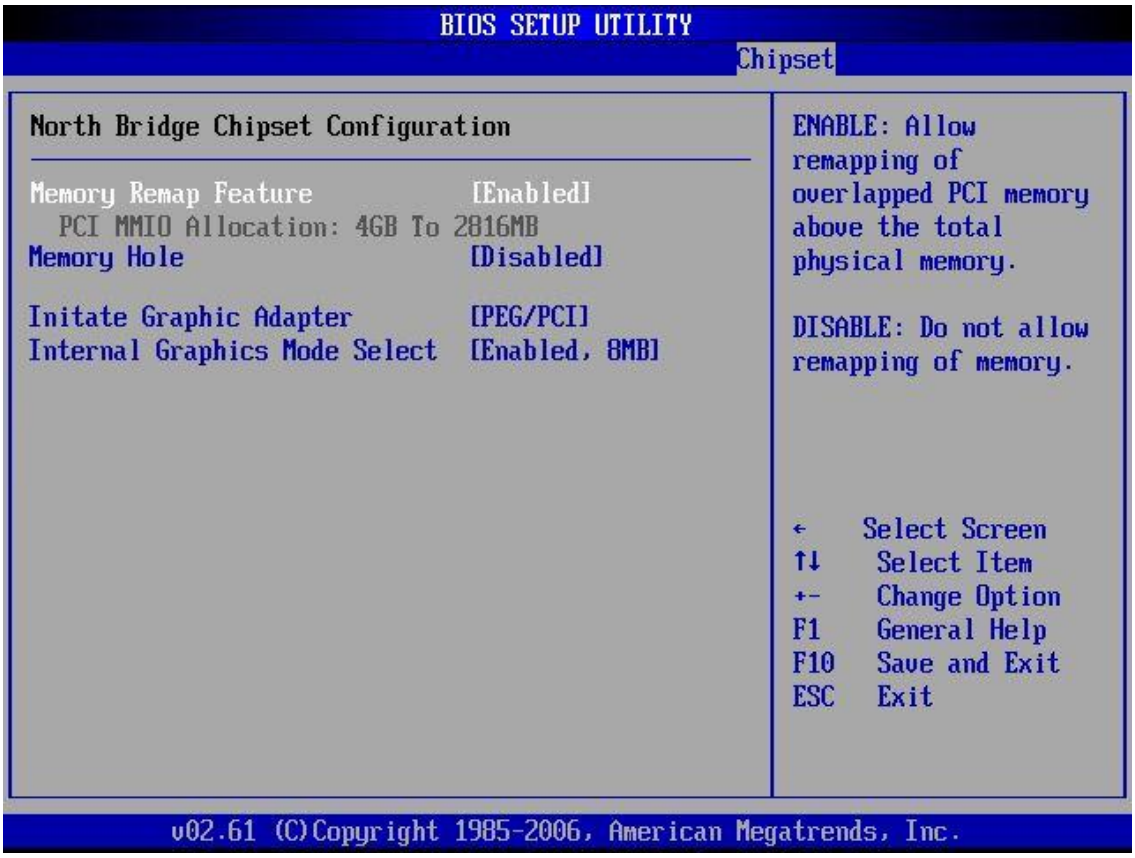
BIOS Menu 19: Chipset

6.7.1 NorthBridge Configuration

Use the NorthBridge Configuration menu (BIOS Menu 19) to configure the northbridge chipset.


BIOS SETUP UTILITY
Chipset
North Bridge Chipset Configuration
Memory Remap Feature [Enabled]
PCI MMIO Allocation: 4GB To 2816MB
Memory Hole [Disabled]
Initate Graphic Adapter [PEG/PCI]
Internal Graphics Mode Select [Enabled, 8MB]
ENABLE: Allow remapping of overlapped PCI memory above the total physical memory.
DISABLE: Do not allow remapping of memory.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 20:NorthBridge Chipset Configuration

➔Memory Remap Feature [Enabled]

Use the **Memory Remap Feature** option to allow the overlapped PCI memory above the total physical memory to be remapped.

➔	**Enabled**	**DEFAULT**	Overlapped PCI memory can be remapped
➔	**Disabled**		Overlapped PCI memory cannor be remapped

➔Memory Hole [Disabled]

Use the **Memory Hole** option to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

➔ **Disabled** **DEFAULT** Memory is not reserved for ISA expansion cards

➔ **15MB – 16MB** Between 15MB and 16MB of memory is reserved for ISA expansion cards

➔Initiate Graphic Adapter

Use the **Initiate Graphic Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PEG/IGD
- PEG/PCI DEFAULT
- PCI/PEG
- PCI/IGD

➔Internal Graphics Mode Select [Enable, 32MB]

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

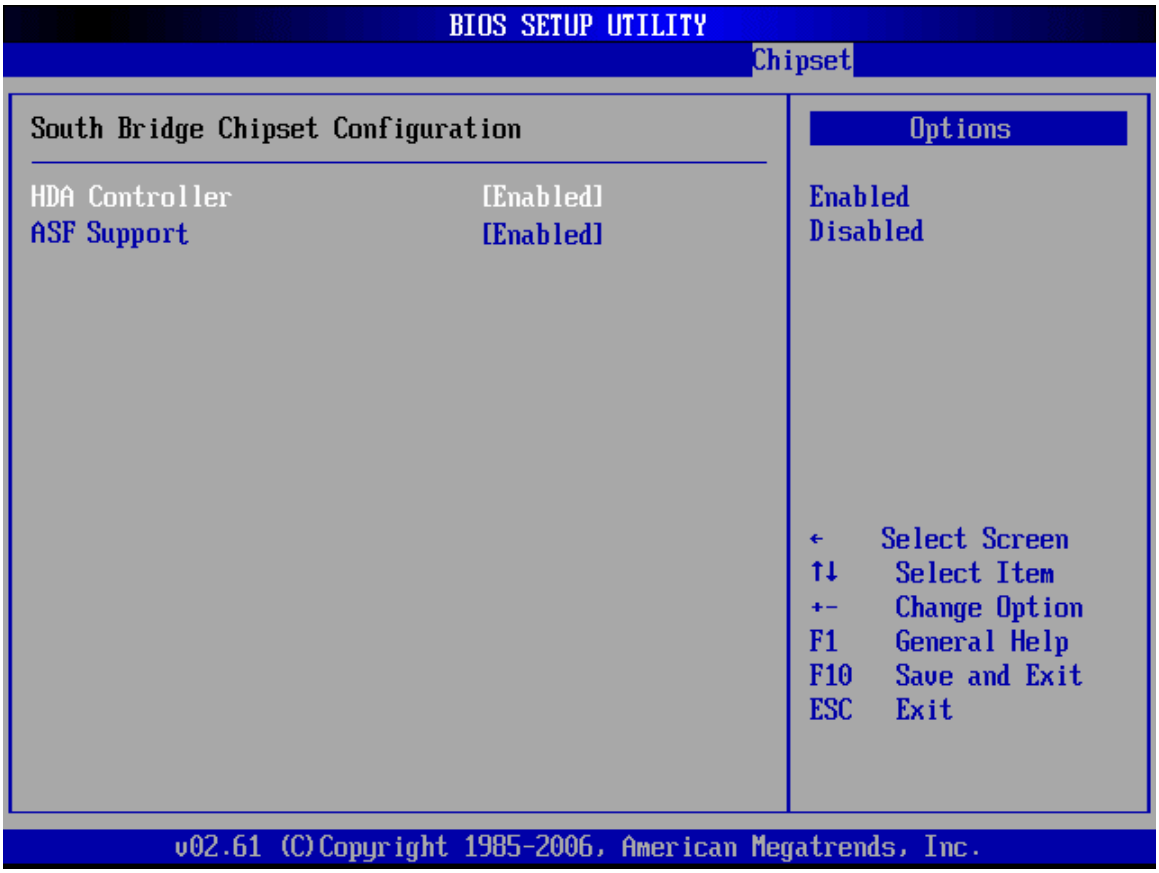
➔ **Disable**

➔ **Enable, 1MB** 1MB of memory used by internal graphics device

➔ **Enable, 8MB** **DEFAULT** 8MB of memory used by internal graphics device

6.7.2 SouthBridge Configuration

The **SouthBridge Configuration** menu (BIOS Menu 21) the southbridge chipset to be configured.



BIOS Menu 21:SouthBridge Chipset Configuration

➔ **HDA Controller [Enabled]**

Use the **HDA Controller** option to enable the high definition audio controller.

➔ **Disabled** HDA controller disabled

➔ **Enabled** (Default) HDA controller enabled

➔ **ASF Support [Enabled]**

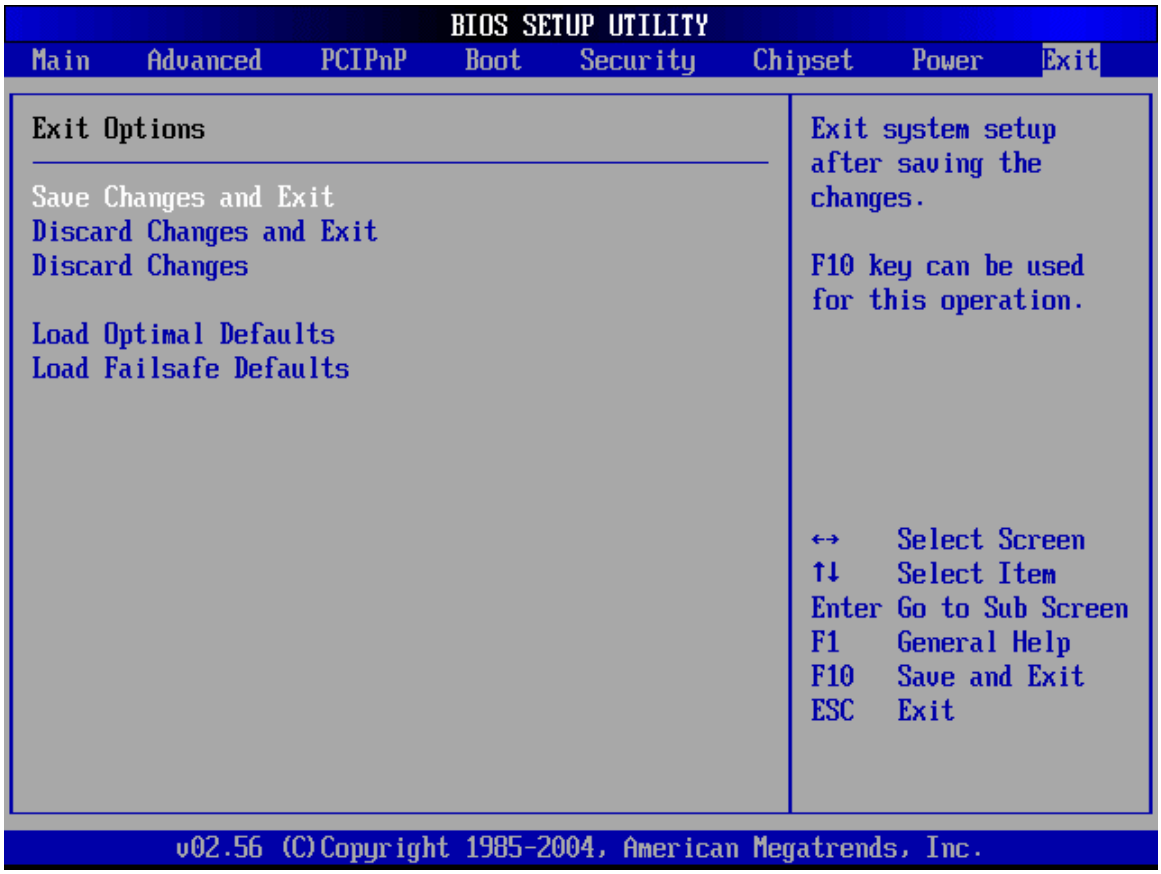
Use the **ASF Support** BIOS option to control the system's ability to connect to a remote management server.

➔ **Disabled** The system will not communicate with a remote management server.

➔ **Enabled** **DEFAULT** The Alert Standard Format (ASF) controller is activated and can communicate with a remote management server.

6.8 Exit

Use the **Exit** menu (**BIOS Menu 22**) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Power Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 22:Exit

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Chapter

7

Driver Installation

7.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- Intel® Chipset driver
- VGA driver (Intel® Graphics Media Accelerator Driver)
- Audio driver (Realtek HD Audio Driver (ALC883))
- SATA driver (Intel® Matrix Storage Manager)
- IDE controller (IT8211)
- LAN Driver

Installation instructions are given below.

7.2 Driver CD Auto-run

All the drivers for the IMBA-9654 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

NOTE:

If the system does not initiate the "autorun" program when the CD is inserted, click the **Start** button, select **Run**, then type **X:\autorun.exe** (where **X:** is the system CD drive) to access the IEI Driver CD main menu.

Step 2: The driver main menu appears (**Figure 7-1**).

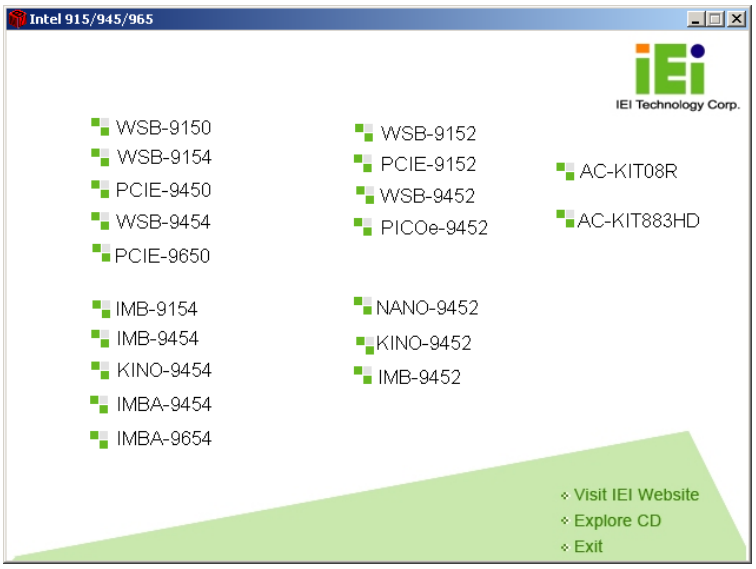

Figure 7-1: Introduction Screen

Step 3: Click IMBA-9654.

Step 4: A new screen with a list of available drivers appears (Figure 7-2).

Figure 7-2: Available Drivers

Step 5: Select the driver to install from the list in **Figure 7-2**. Detailed driver installation instructions follow below. **Step 0:**

7.3 Chipset Driver Installation

To install the chipset driver, please follow the steps below.

Step 1: Select **INF** from the list in **Figure 7-2**.

Step 2: A new window opens (Figure 7-3).

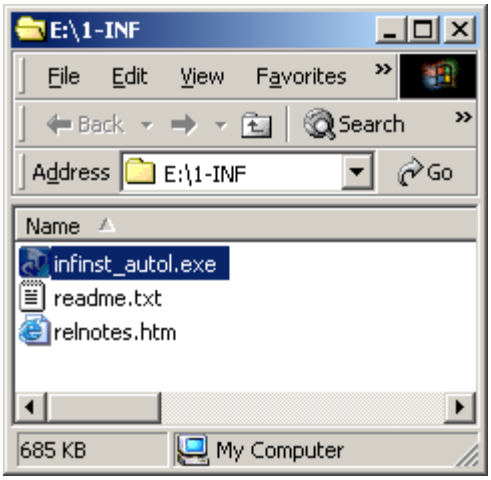

Figure 7-3: Chipset Driver Installation Program

Step 3: Double-click the **infinst_Autol.exe** icon.

Step 4: The welcome screen in **Figure 7-4** appears.

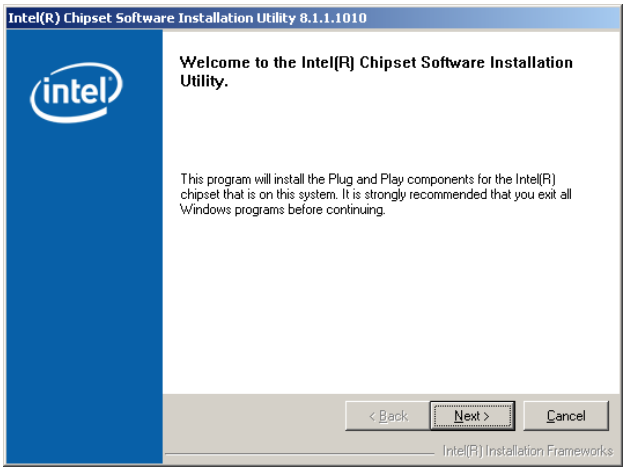
Intel(R) Chipset Software Installation Utility 8.1.1.1010
Welcome to the Intel(R) Chipset Software Installation Utility.
This program will install the Plug and Play components for the Intel(R) chipset that is on this system. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-4: Chipset Driver Installation Welcome Screen

Step 5: Click **NEXT** to continue the installation process.

Step 6: The license agreement in **Figure 7-5** appears.

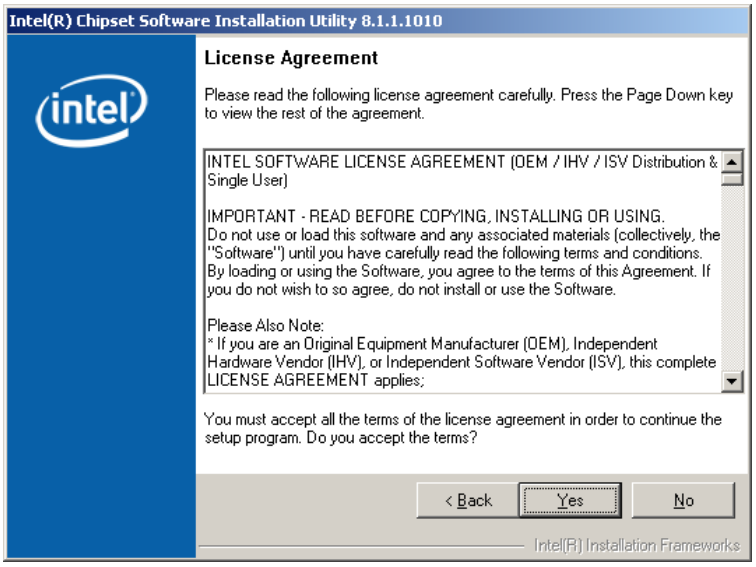
Intel(R) Chipset Software Installation Utility 8.1.1.1010
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-5: Chipset Driver Installation License Agreement

Step 7: Read the license agreement. To accept the terms and conditions stipulated in the agreement, click **YES**.

Step 8: The Readme file in Figure 7-6 appears.

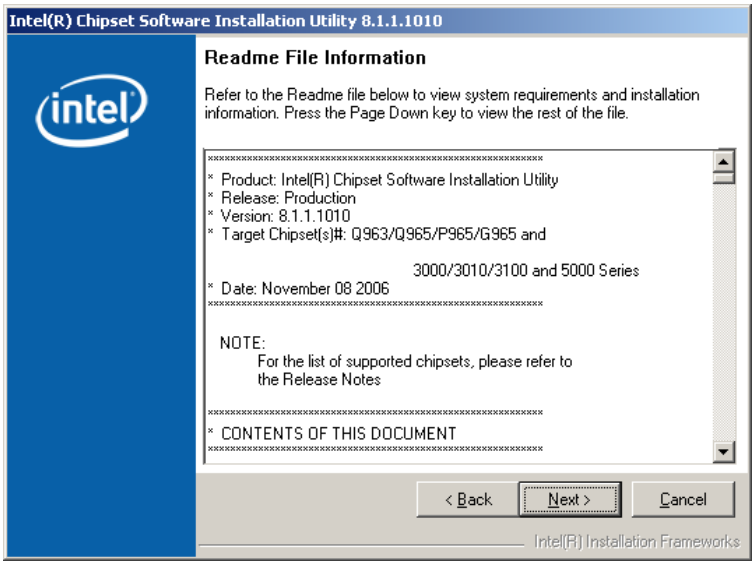
Intel(R) Chipset Software Installation Utility 8.1.1.1010
Readme File Information
Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
* Product: Intel(R) Chipset Software Installation Utility
* Release: Production
* Version: 8.1.1.1010
* Target Chipset(s)#: Q963/Q965/P965/G965 and
3000/3010/3100 and 5000 Series
* Date: November 08 2006
NOTE:
For the list of supported chipsets, please refer to the Release Notes
* CONTENTS OF THIS DOCUMENT
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-6: Chipset Driver Readme File Information

Step 9: Read the Readme file information and then click **NEXT** to start the driver

installation.

Step 10: After the driver installation process is complete, a confirmation screen appears (**Figure 7-7**). **Step 0:**

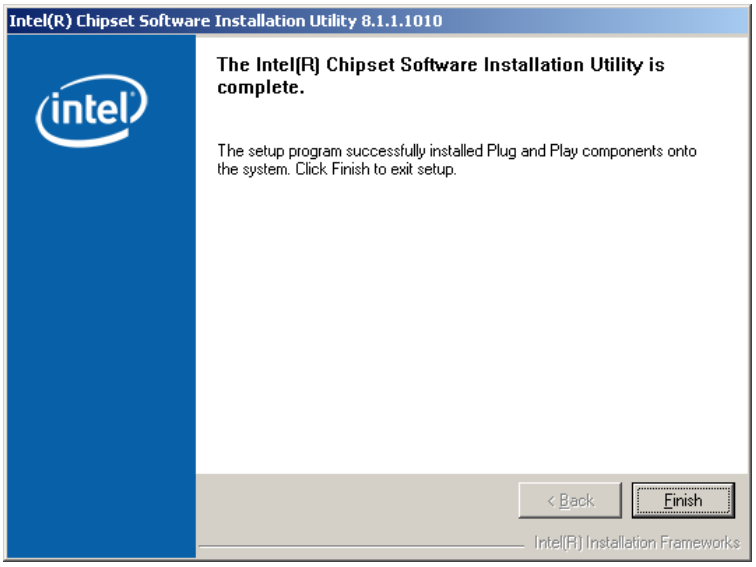
Intel(R) Chipset Software Installation Utility 8.1.1.1010
The Intel(R) Chipset Software Installation Utility is complete.
The setup program successfully installed Plug and Play components onto the system. Click Finish to exit setup.
< Back
Finish
Intel(R) Installation Frameworks

Figure 7-7: Chipset Driver Installation Complete

Step 1: Click **FINISH** to complete the driver installation.

7.4 Intel Graphics Media Accelerator Driver Installation

To install the chipset driver, please follow the steps below.

Step 2: Select the VGA driver from the list in **Figure 7-2**.

Step 3: A new window opens (**Figure 7-8**).

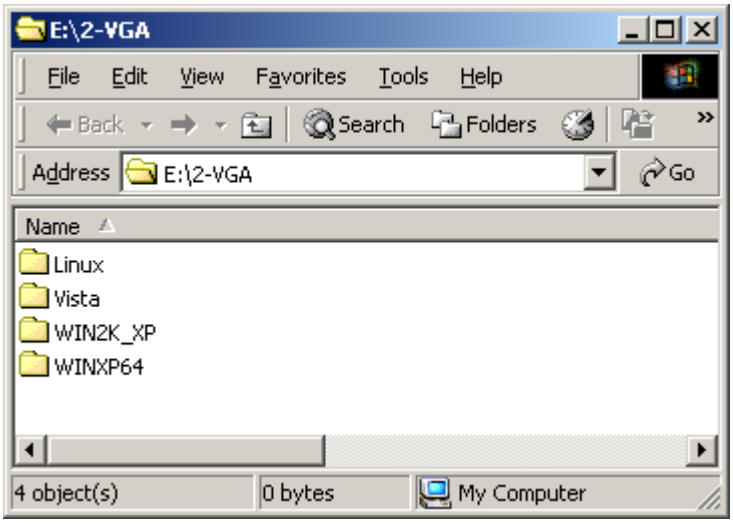

Figure 7-8: Select the Operating System

Step 4: Double-click the appropriate operating system folder.

Step 5: A new window appears (**Figure 7-9**).

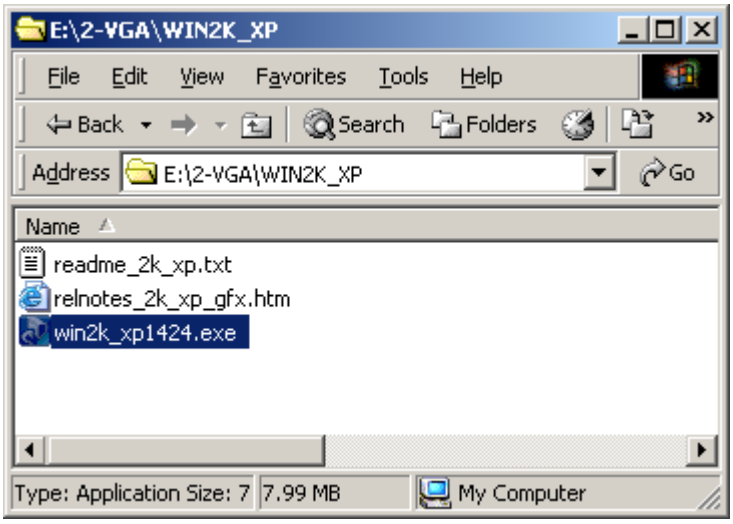

Figure 7-9: VGA Driver

Step 6: Double-click the installation program icon to continue the installation process.

Step 7: The Readme information file shown in **Figure 7-10** appears.

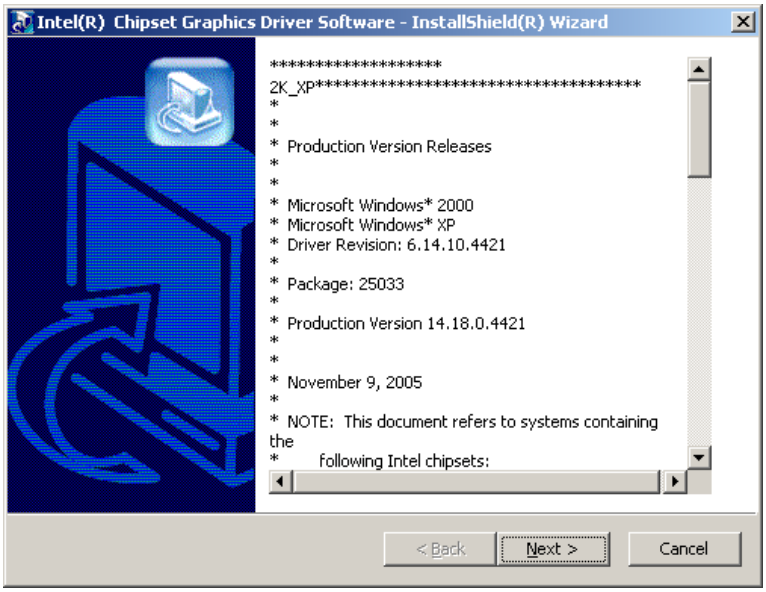

Figure 7-10: Intel® Graphics Media Accelerator InstallShield Wizard

Step 8: Read the Readme file information and click **NEXT** to begin extracting files (**Figure 7-11**).

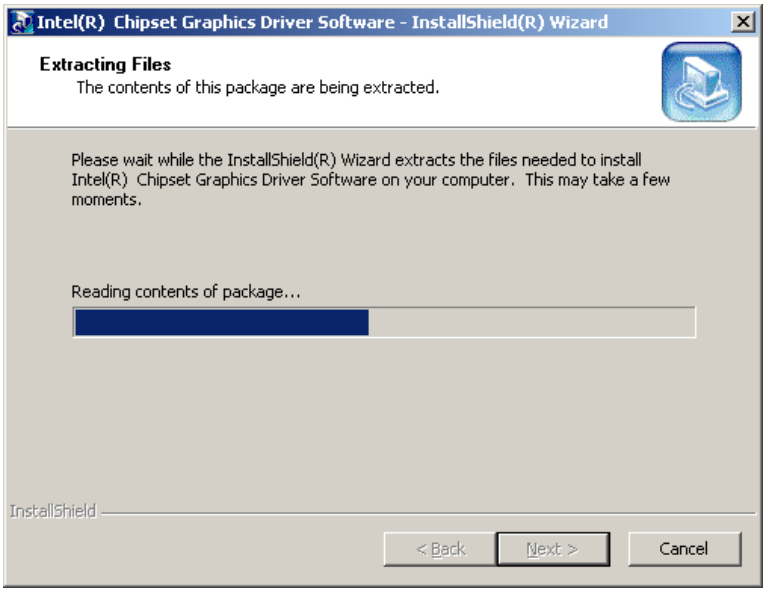
Intel(R) Chipset Graphics Driver Software - InstallShield(R) Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield(R) Wizard extracts the files needed to install Intel(R) Chipset Graphics Driver Software on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

Figure 7-11: InstallShield Wizard Extracting Files

Step 9: The **Graphics Media Accelerator Driver Welcome** screen appears (Figure 7-12).

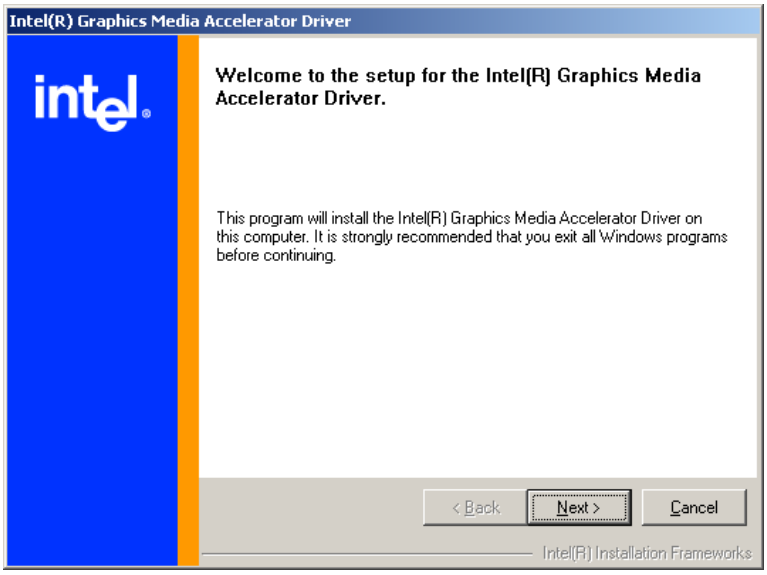
Intel(R) Graphics Media Accelerator Driver
intel
Welcome to the setup for the Intel(R) Graphics Media Accelerator Driver.
This program will install the Intel(R) Graphics Media Accelerator Driver on this computer. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-12: Intel® Graphics Media Accelerator Driver Welcome Screen

Step 10: Click **NEXT** and a license agreement appears (**Figure 7-13**).

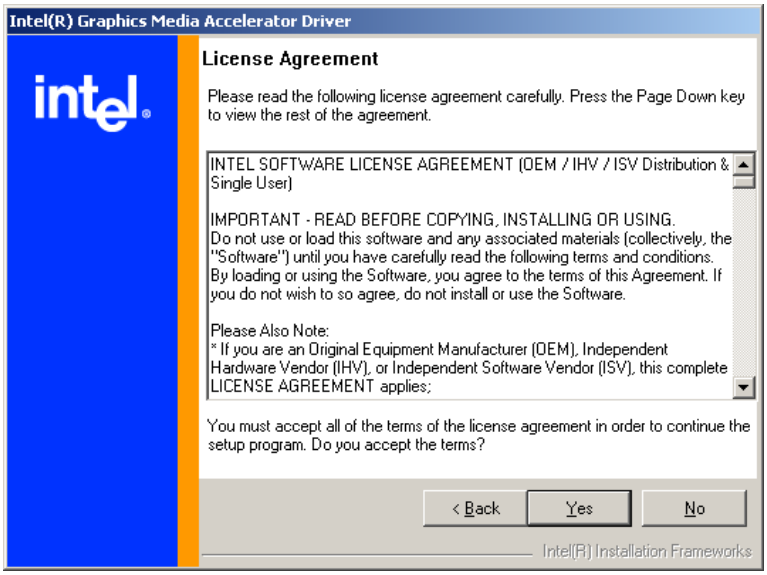
Intel(R) Graphics Media Accelerator Driver
intel
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-13: Intel® Graphics Media Accelerator Driver License Agreement

Step 11: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the installation notice appears (**Figure 7-14**) as the driver is installed.

Figure 7-14: Intel® Graphics Media Accelerator Driver Installing Notice

Step 12: After the driver installation process is complete, a confirmation screen appears (**Figure 7-15**).

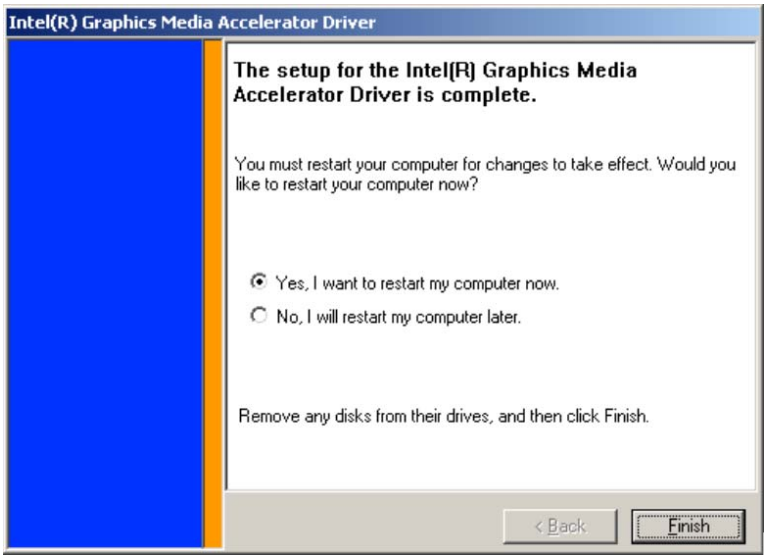
Intel(R) Graphics Media Accelerator Driver
The setup for the Intel(R) Graphics Media Accelerator Driver is complete.
You must restart your computer for changes to take effect. Would you like to restart your computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish.
< Back
Finish

Figure 7-15: Intel® Graphics Media Accelerator Installation Complete

Step 13: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer. **Step 0:**

7.5 Broadcom LAN Driver (for GbE LAN) Installation

To install the Broadcom LAN driver, please follow the steps below.

Step 1: Open **Windows Control Panel (**Figure 7-16).

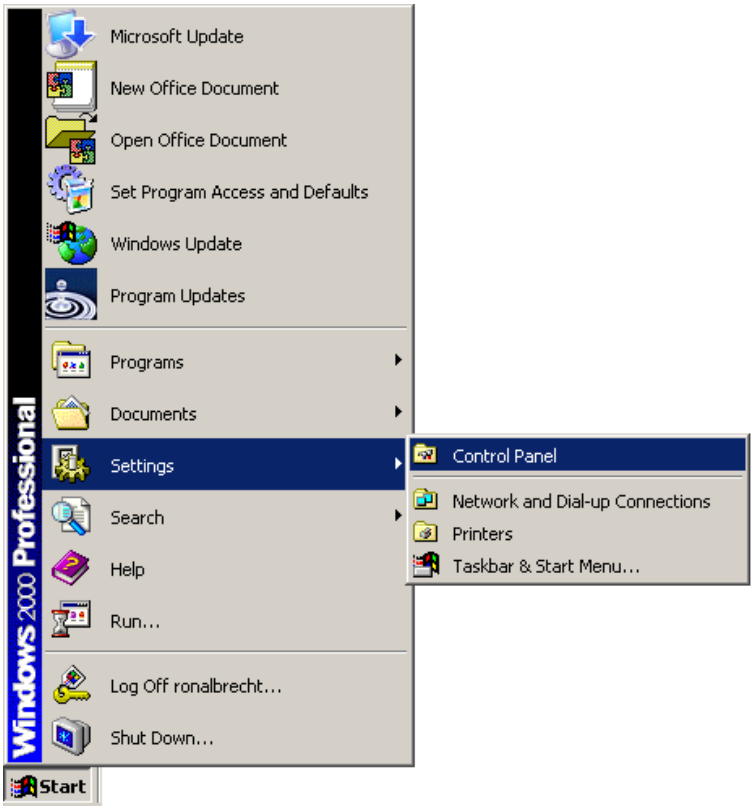

Figure 7-16: Windows Control Panel

Step 2: Double-click the **System** icon (Figure 7-17).

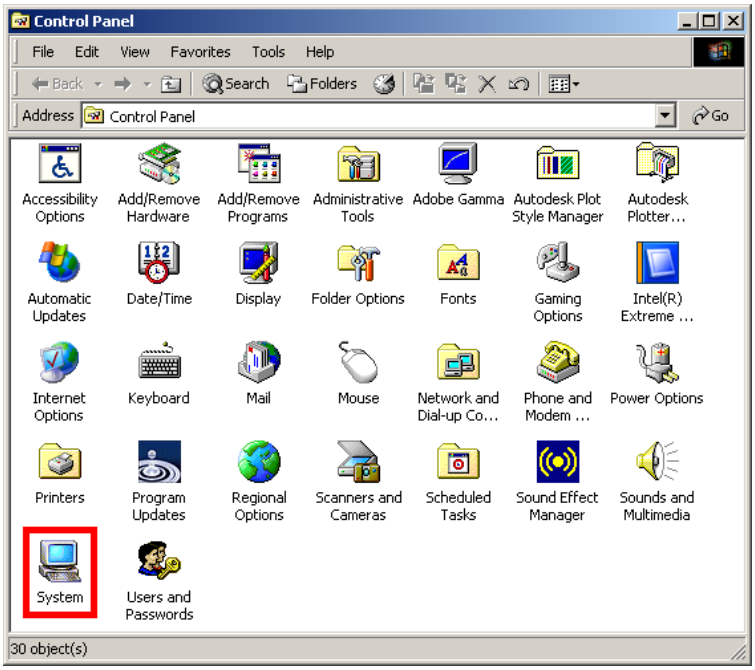

Figure 7-17: System Icon

Step 3: Click the **Device Manager** tab (Figure 7-18).

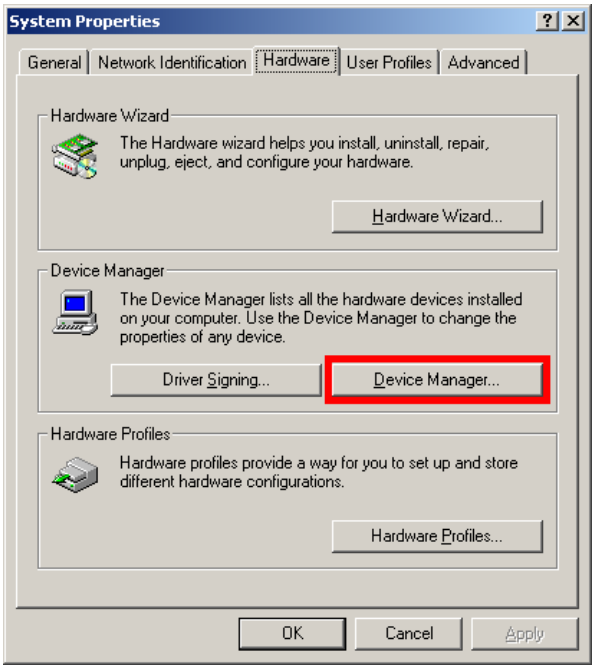
System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

Figure 7-18: Device Manager Tab

Step 4: A list of system hardware devices appears (Figure 7-19).

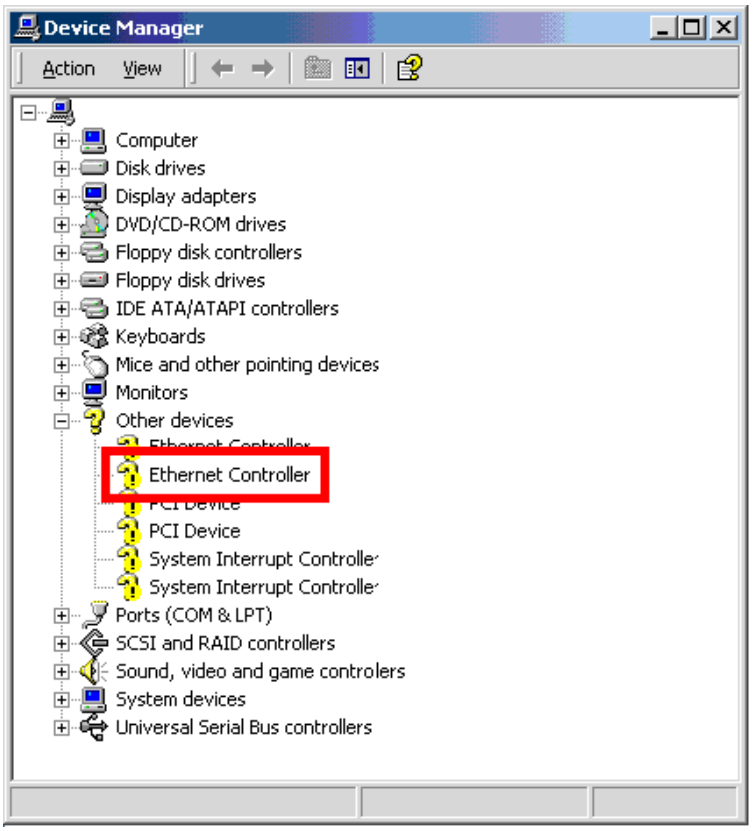

Figure 7-19: Device Manager List

Step 5: Double-click the listed device that has question marks next to it (this means Windows does not recognize the device).

Step 6: The **Device Driver Wizard** appears (Figure 7-20).

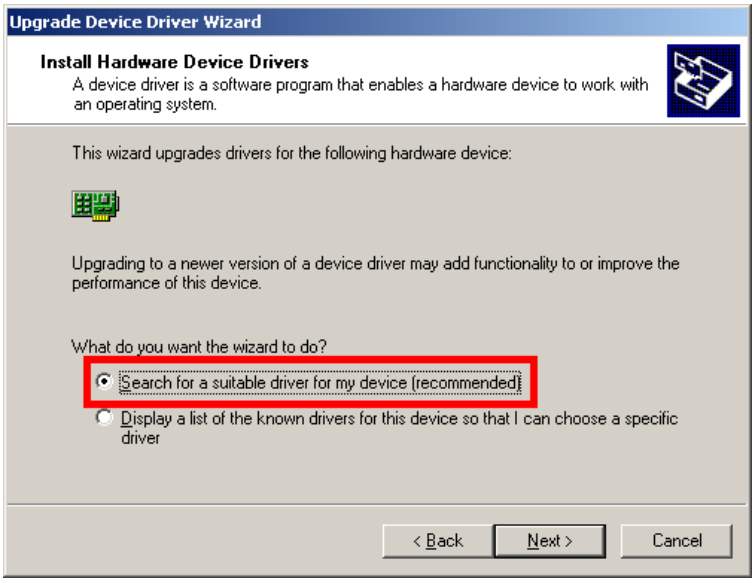
Upgrade Device Driver Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard upgrades drivers for the following hardware device:
Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

Figure 7-20: Search for Suitable Driver

Step 7: Select "**Search for a suitable driver for my device (recommended)**," and click **NEXT** to continue.

Step 8: Select "**Specify a Location**" in the **Locate Driver Files** window (Figure 7-21).

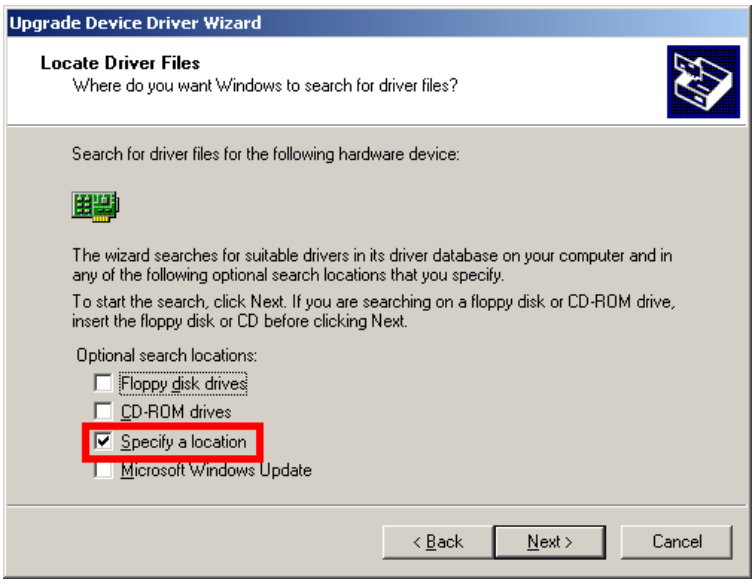
Upgrade Device Driver Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

Figure 7-21: Locate Driver Files

Step 9: Click **NEXT** to continue.

Step 10: The **Locate File** window appears (Figure 7-22).

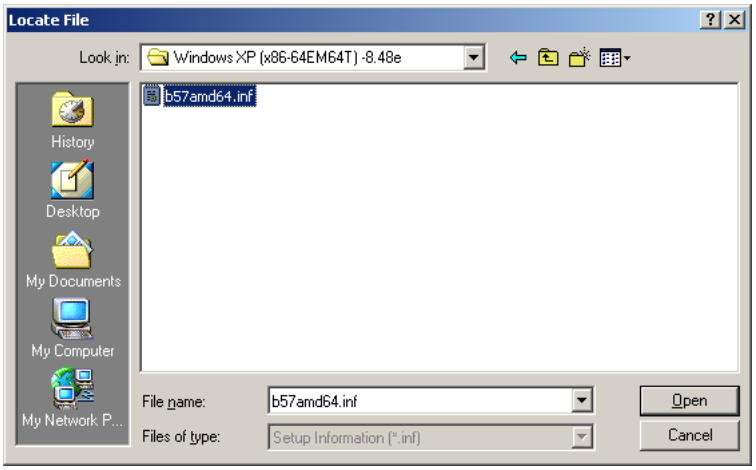

Figure 7-22: Location Browsing Window

Step 11: Select the proper OS folder under the "**X:\3-LAN\BROADCOM BCM57xx Drivers**" directory in the **Locate File** window, where "**X:\"** is the system CD drive.

Step 12: Click **OPEN** and the driver is installed.

7.6 Realtek HD Audio Driver (ALC883) Installation

To install the Realtek High Definition (HD) Audio driver, please follow the steps below.

7.6.1 BIOS Setup

Step 1: Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.

Step 2: Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [Azalia].

Step 3: Press **F10** to save the changes and exit the BIOS setup. The system reboots.

7.6.2 Driver Installation

To install the audio driver please follow the steps below.

Step 1: Select **AUDIO** from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-23**).

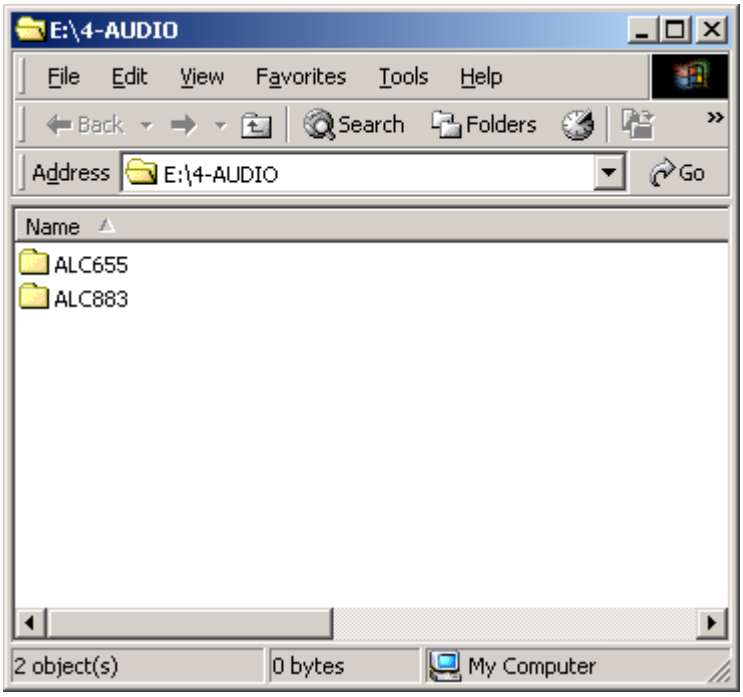

Figure 7-23: Select the Audio CODEC

Step 3: Double-click the ALC883 folder.

Step 4: Double-click the appropriate operating system folder (**Figure 7-24**).

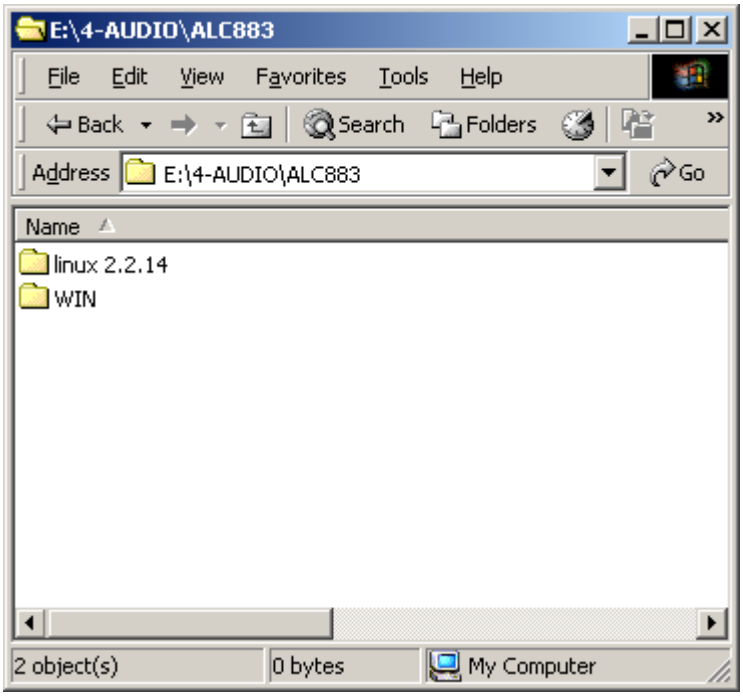

Figure 7-24: Select the OS

Step 5: Double-click the appropriate operating system version folder (**Figure 7-25**).

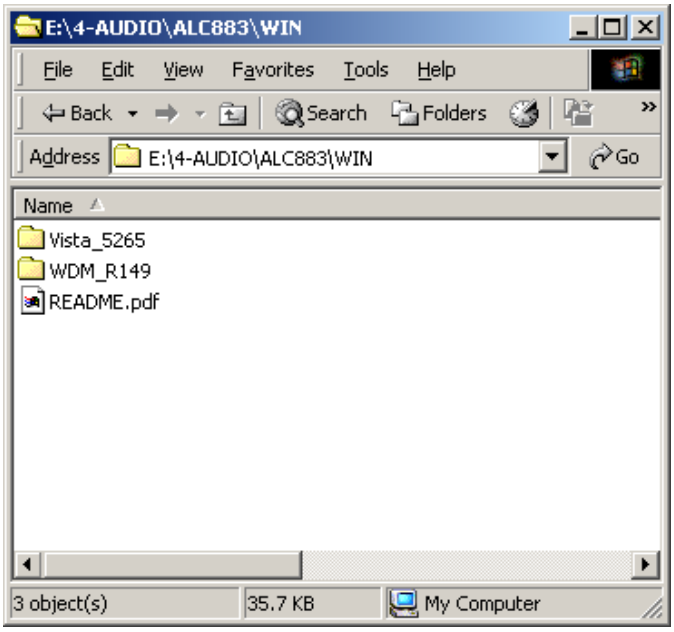

Figure 7-25: Select the OS Version

Step 6: Double-click the **Setup.exe** program icon in **Figure 7-26**.

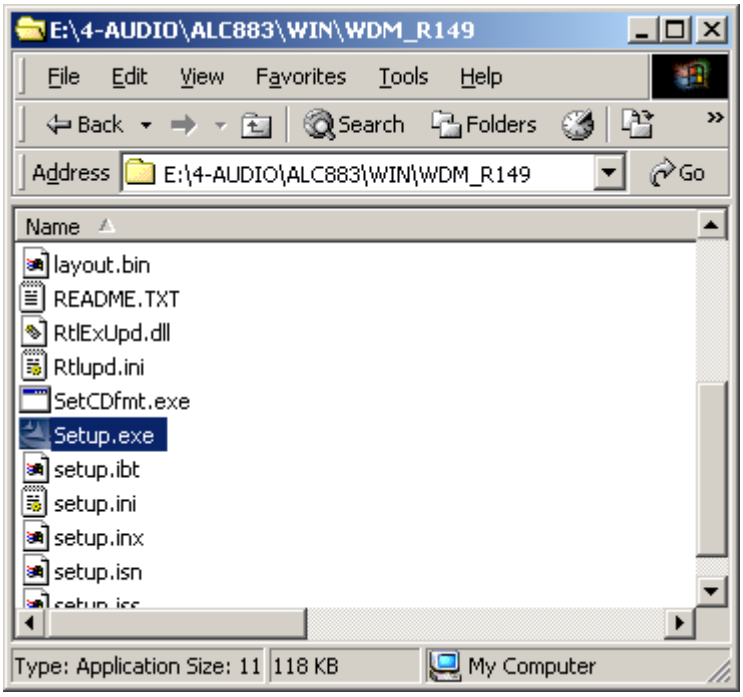

Figure 7-26: Locate the Setup Program Icon

Step 7: The **InstallShield Wizard** starts (**Figure 7-27**).

Figure 7-27: The InstallShield Wizard Starts

Step 8: The **InstallShield Wizard** is prepared to guide the user through the rest of the process (**Figure 7-28**).

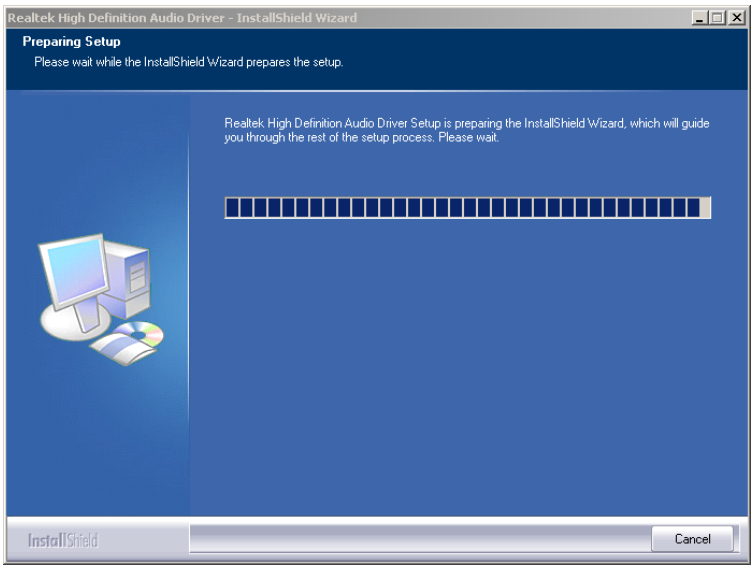
Realtek High Definition Audio Driver - InstallShield Wizard
Preparing Setup
Please wait while the InstallShield Wizard prepares the setup.
Realtek High Definition Audio Driver Setup is preparing the InstallShield Wizard, which will guide you through the rest of the setup process. Please wait.
InstallShield
Cancel

Figure 7-28: Preparing Setup Screen

Step 9: Once initialized, the **InstallShield Wizard** welcome screen appears (**Figure 7-29**).

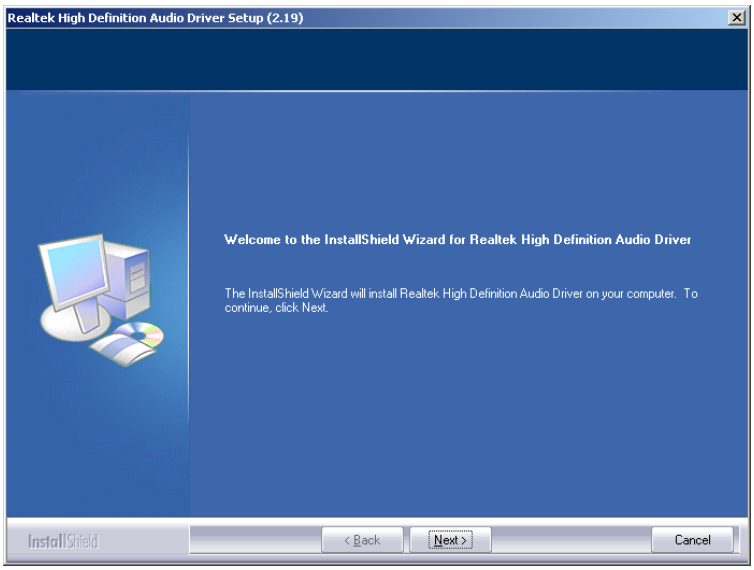
Realtek High Definition Audio Driver Setup (2.19)
Welcome to the InstallShield Wizard for Realtek High Definition Audio Driver
The InstallShield Wizard will install Realtek High Definition Audio Driver on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel

Figure 7-29: InstallShield Wizard Welcome Screen

Step 10: Click **NEXT** to continue the installation.

Step 11: InstallShield starts to install the new software as shown in Figure 7-30.

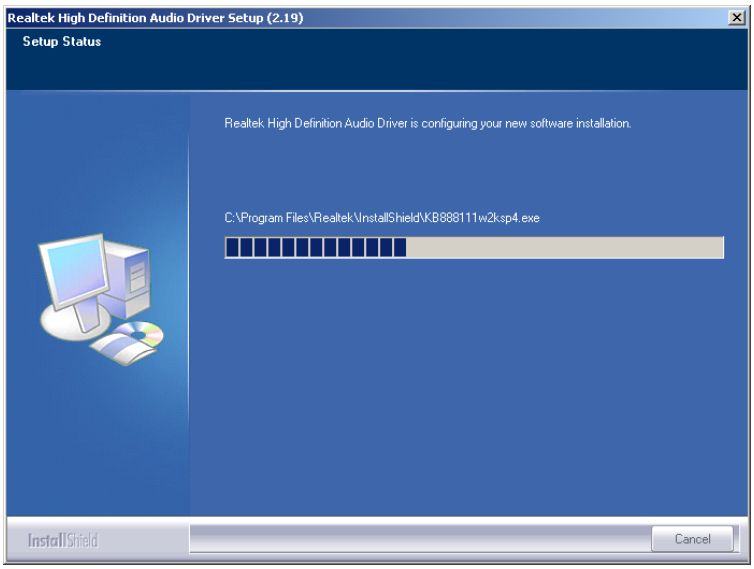
Realtek High Definition Audio Driver Setup (2.19)
Setup Status
Realtek High Definition Audio Driver is configuring your new software installation.
C:\Program Files\Realtek\InstallShield\KB888111w2ksp4.exe
InstallShield
Cancel

Figure 7-30: Audio Driver Software Configuration

Step 12: The Installation Wizard updates the system as shown in Figure 7-31.

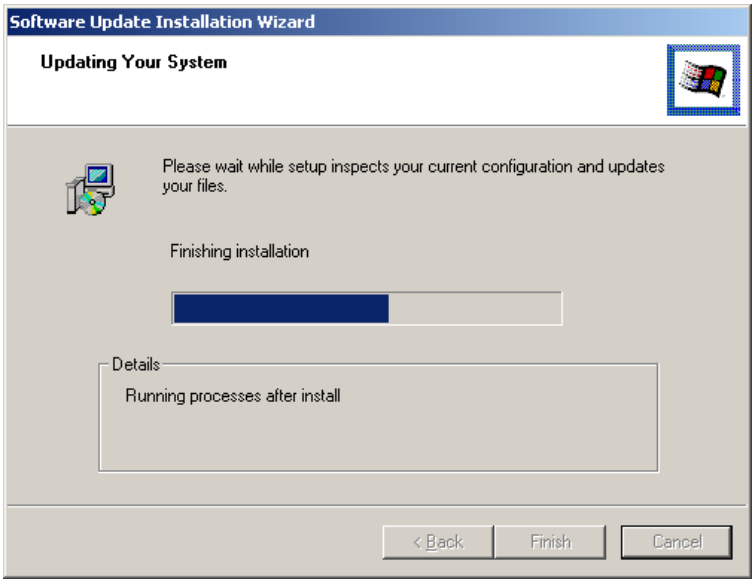

Figure 7-31: Installation Wizard Updates the System

Step 13: After the driver installation process is complete, a confirmation screen appears (**Figure 7-32**).

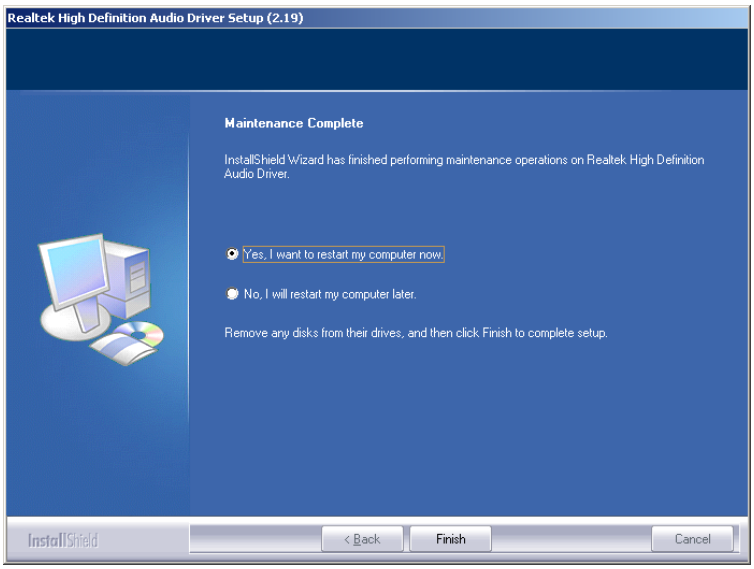
Realtek High Definition Audio Driver Setup (2.19)
Maintenance Complete
InstallShield Wizard has finished performing maintenance operations on Realtek High Definition Audio Driver.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
InstallShield
< Back
Finish
Cancel

Figure 7-32: Restart the Computer

Step 14: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.7 SATA RAID Driver Installation

To install the Intel® Matrix Storage Manager driver, please follow the steps below:

Step 1: Select **SATA** from the list in **Figure 7-2**.

Step 2: A new window opens (Figure 7-33).

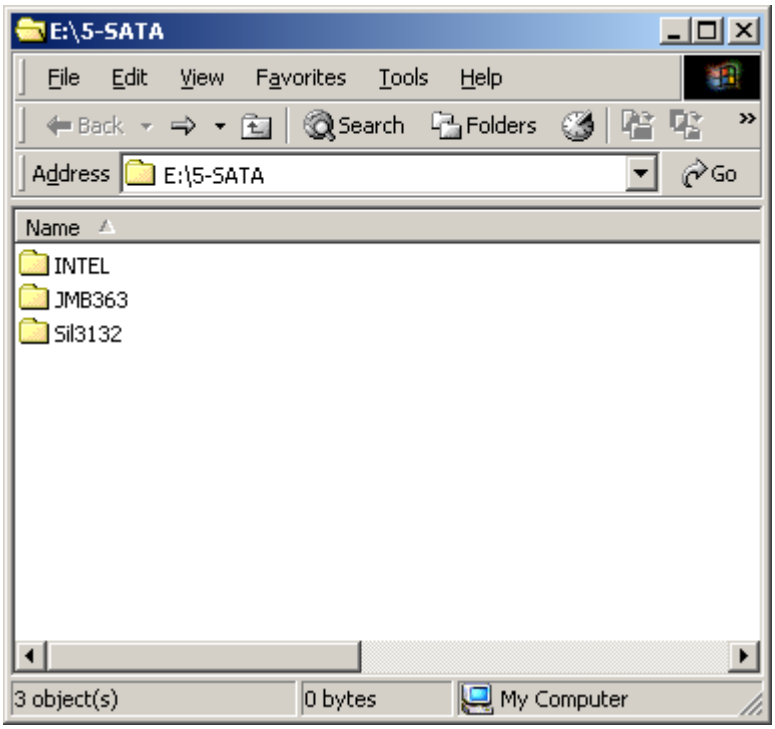

Figure 7-33: SATA RAID Driver Installation Program

Step 3: Double-click the **INTEL** folder.

Step 4: Double-click the **iata62_cd.exe** program icon in **Figure 7-34**.

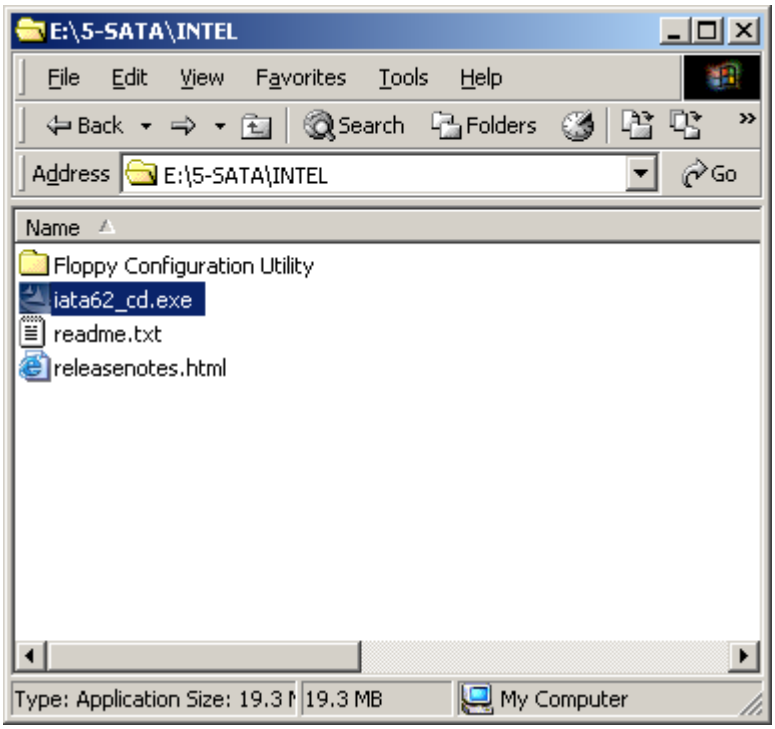

Figure 7-34: SATA RAID Setup Program Icon

Step 5: **Figure 7-35** shows the **InstallShield Wizard** preparing to guide the user through the rest of the process.

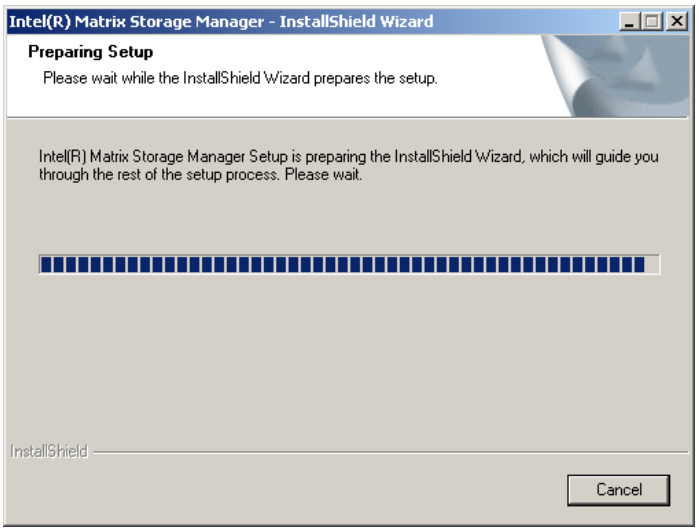
Intel(R) Matrix Storage Manager - InstallShield Wizard
Preparing Setup
Please wait while the InstallShield Wizard prepares the setup.
Intel(R) Matrix Storage Manager Setup is preparing the InstallShield Wizard, which will guide you through the rest of the setup process. Please wait.
InstallShield
Cancel

Figure 7-35: InstallShield Wizard Setup Screen

Step 6: **Figure 7-36** shows the **Matrix Storage Manager** software configuring the installation process.

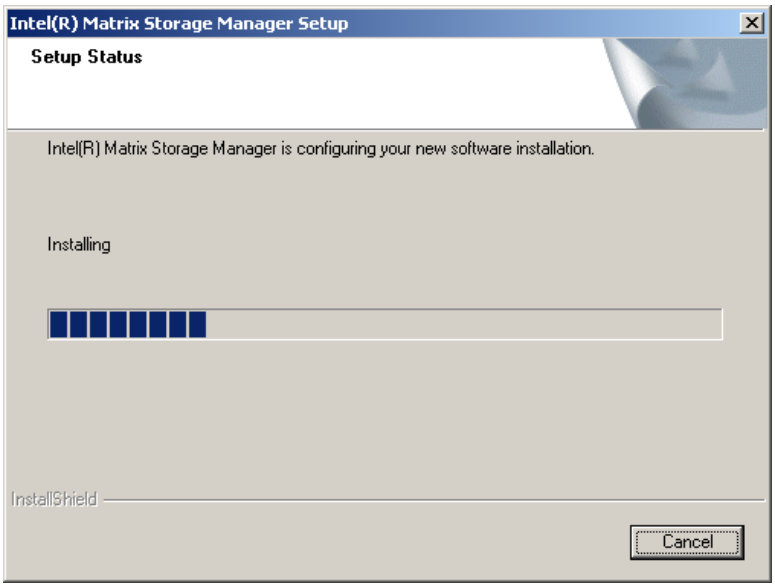

Figure 7-36: Matrix Storage Manager Setup Screen

Step 7: **Figure 7-37** shows the **Matrix Storage Manager** welcome screen.

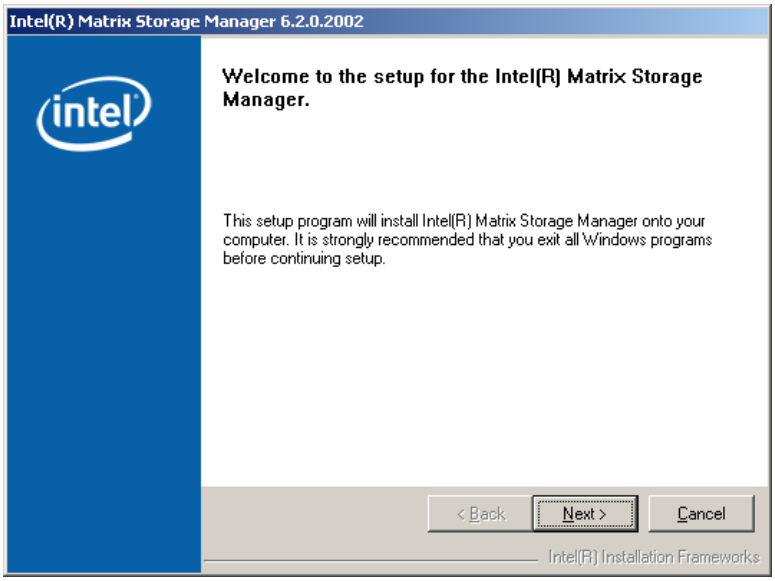
Intel(R) Matrix Storage Manager 6.2.0.2002
intel
Welcome to the setup for the Intel(R) Matrix Storage Manager.
This setup program will install Intel(R) Matrix Storage Manager onto your computer. It is strongly recommended that you exit all Windows programs before continuing setup.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-37: Matrix Storage Manager Welcome Screen

Step 8: Click **NEXT** and a warning appears (**Figure 7-38**). Read the warning carefully and decide whether or not to continue the installation process.

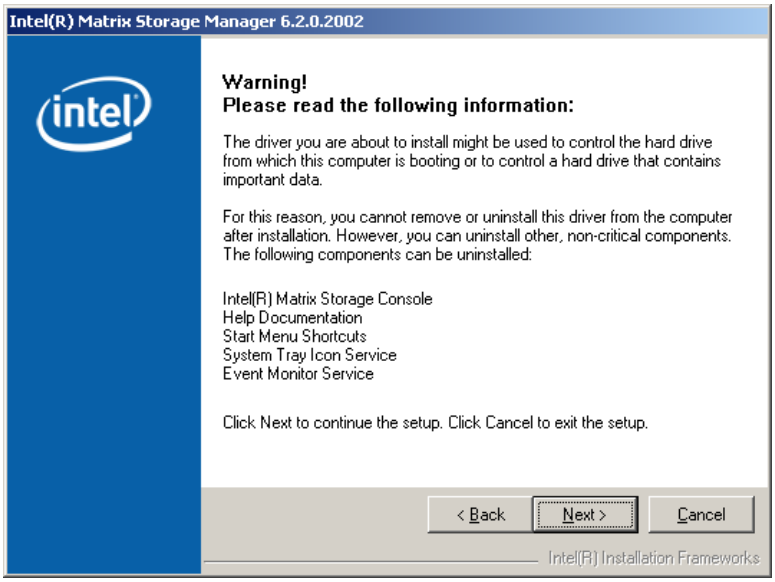
Intel(R) Matrix Storage Manager 6.2.0.2002
Warning!
Please read the following information:
The driver you are about to install might be used to control the hard drive from which this computer is booting or to control a hard drive that contains important data.
For this reason, you cannot remove or uninstall this driver from the computer after installation. However, you can uninstall other, non-critical components. The following components can be uninstalled:
Intel(R) Matrix Storage Console
Help Documentation
Start Menu Shortcuts
System Tray Icon Service
Event Monitor Service
Click Next to continue the setup. Click Cancel to exit the setup.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-38: Matrix Storage Manager Warning Screen

Step 9: Click **NEXT** and a license agreement appears (**Figure 7-39**).

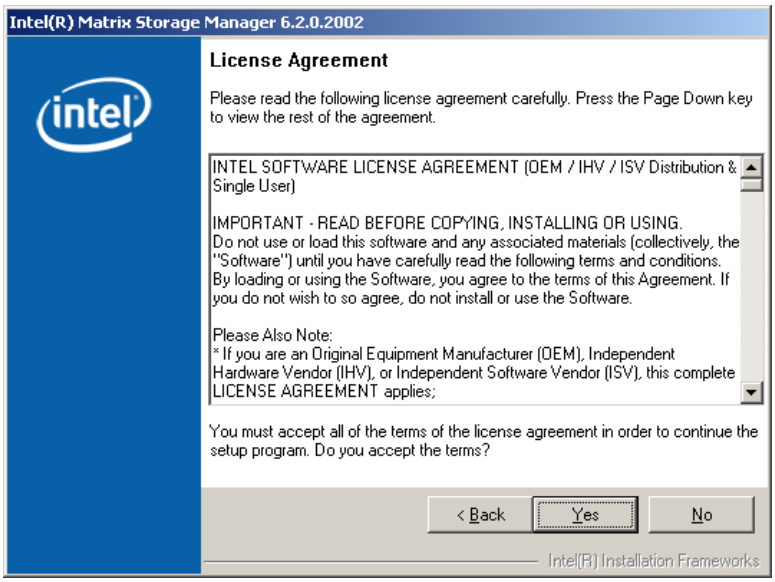
Intel(R) Matrix Storage Manager 6.2.0.2002
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-39: Matrix Storage Manager License Agreement

Step 10: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the Readme information file shown in **Figure 7-40** appears.

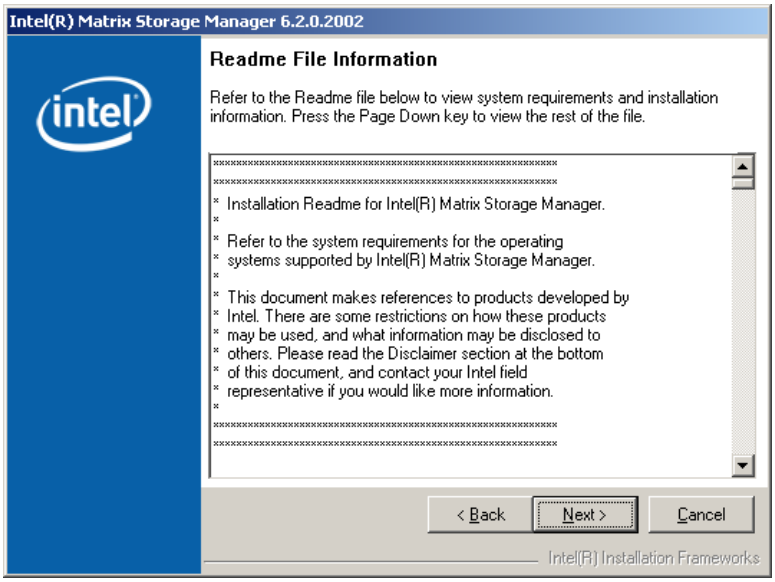
Intel(R) Matrix Storage Manager 6.2.0.2002
Readme File Information
Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
* Installation Readme for Intel(R) Matrix Storage Manager.
* Refer to the system requirements for the operating
* systems supported by Intel(R) Matrix Storage Manager.
* This document makes references to products developed by
* Intel. There are some restrictions on how these products
* may be used, and what information may be disclosed to
* others. Please read the Disclaimer section at the bottom
* of this document, and contact your Intel field
* representative if you would like more information.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-40: Matrix Storage Manager Readme File

Step 11: Read the Readme file information and click **NEXT**.

Step 12: After the driver installation process is complete, a confirmation screen appears (**Figure 7-41**).

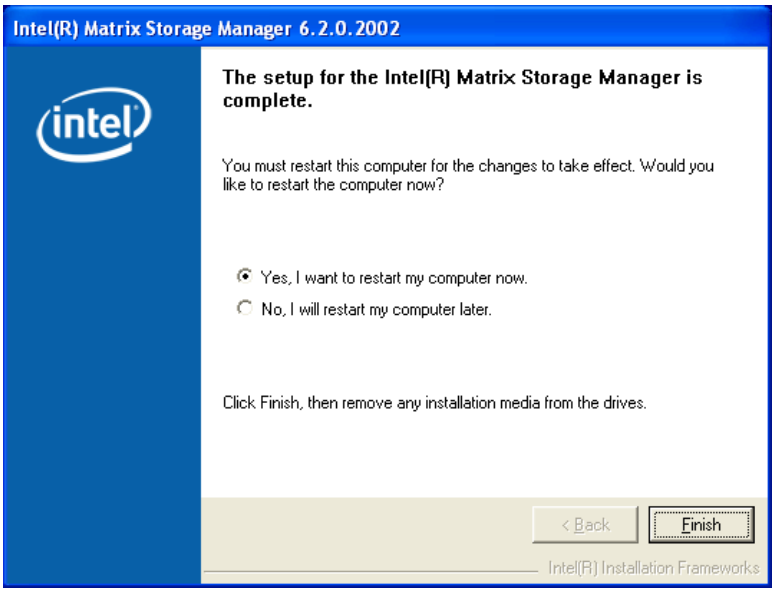
Intel(R) Matrix Storage Manager 6.2.0.2002
The setup for the Intel(R) Matrix Storage Manager is complete.
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Click Finish, then remove any installation media from the drives.
< Back
Finish
Intel(R) Installation Frameworks

Figure 7-41: Matrix Storage Manager Setup Complete

Step 13: The confirmation screen offers the option of restarting the computer now or later.

For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

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Appendix

A

BIOS Options

The following is a list of the BIOS options that are available on this board.

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➔ SATA#2 Compatible 119
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➔ Auto-Detected Drive Parameters 120
➔ Type [Auto] 121
➔ ZIP 121
➔ LS-120 121
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➔ Serial Port3 Address [3E8] 128
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➔ Temperature n Limit of OFF [000] 132
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➔ Slope PWM n [0.5 PWM] 133
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➔ Flow Control 140
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➔ Terminal Type 140
➔ VT-UTF8 Combo Key Support 140
➔ Sredir Memory Display Delay 140
➔ Serial Port Number [COM1] 140
➔ Base Address, IRQ [3F8h,4] 141
➔ Serial Port Mode [115200 8,n,1] 141
➔ Flow Control [None] 141
➔ Redirection After BIOS POST [Always] 142
➔ Terminal Type [ANSI] 142
➔ VT-UTF8 Combo Key Support [Disabled] 142
➔ Sredir Memory Display Delay [Disabled] 143
➔ TCG/TPM Support [Yes] 144
➔ TPM Enable/Disable Status [No State] 144

➔ TPM Owner Status [No State] 144
➔ USB Functions [Enabled] 145
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Appendix

B

Terminology

AC ’97	Audio Codec 97 (AC’97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
APM	The Advanced Power Management (APM) application program interface (API) enables the inclusion of power management in the BIOS.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude (“volume”) of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.

DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Ouput Controll Hub (ICH) is an Intel® Southbridge chipset.

IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.
LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
MAC	The Media Access Control (MAC) protocol enables several terminals or network nodes to communicate in a LAN, or other multipoint networks.
PCIe	PCI Express (PCIe) is a communications bus that uses dual data lines for full-duplex (two-way) serial (point-to-point) communications between the SBC components and/or expansion cards and the SBC chipsets. Each line has a 2.5 Gbps data transmission rate and a 250 MBps sustained data transfer rate.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
QVGA	Quarter Video Graphics Array (QVGA) refers to a display with a resolution of 320 x 240 pixels.
RAID	Redundant Array of Inexpensive Disks (RAID) refers to redundantly backing up data on multiple disks to ensure that if one disk fails, the data is not lost and can be restored from the remaining disks in the array.
RAM	Random Access Memory (RAM) is volatile memory that loses data

	when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates, while USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

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Appendix

C

DIO Interface

C.1 DIO Interface Introduction

The DIO connector on the IMBA-9654 is interfaced to GIO ports on the iTE Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

For further information, please refer to the datasheet for the iTE Super I/O chipset.

C.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

C.3 Assembly Language Samples

C.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV	**AX, 6F08H**	Sets the digital port as input
INT	**15H**	Initiates the INT 15H BIOS call

C.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	**AX, 6F09H**	Sets the digital port as output
MOV	**BL, 09H**	
INT	**15H**	Initiates the INT 15H BIOS call

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Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1     ;is the application over?
        JNE      W_LOOP         ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```

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Appendix

E

Address Mapping

E.1 Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	Intel Graphics Controller
3C0-3DF	Intel Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table E-1: IO Address Map

E.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table E-2: 1st MB Memory Address Map

E.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table E-3: IRQ Mapping Table

E.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table E-4: IRQ Mapping Table

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Appendix

F

Compatibility

NOTE:

The compatible items described here have been tested by the IEI R&D team and found to be compatible with the IMBA-9654

F.1 Compatible Operating Systems

The following operating systems have been successfully run on the IMBA-9654.

- Windows 2000 with Service Pack 4
- Windows Server 2003 (32-bit)
- Windows Server 2003 (64-bit)
- Windows XP with Service Pack 2 (32-bit)
- Windows XP with Service Pack 2 (64-bit)
- Windows XP Embedded POS
- Windows Vista (32-bit)
- Windows Vista (64-bit)
- Mardriva 2008
- Ubuntu 7.10
- Fedora Core 8

F.2 Compatible Processors

The following Socket AM2 processors have been successfully tested on the IMBA-9654

CPU	Model Number	Frequency	Bus Speed
Intel® Core™2 Duo	E6700	2.66 GHz	1,066 MHz
Intel® Core™2 Duo	E6600	2.40 GHz	1,066 MHz
Intel® Core™2 Duo	E6400	2.13 GHz	1,066 MHz
Intel® Core™2 Duo	E6420	2.13 GHz	1,066 MHz
Intel® Core™2 Duo	E6300	1.86 GHz	1,066 MHz

Intel® Core™2 Quad	Q6600	2.40 GHz	1,066 MHz
Intel® Pentium® 4	Extreme Edition	3.73 GHz	1,066 MHz
Intel® Pentium® D	960	3.60 GHz	800 MHz
Intel® Pentium® D	930	3.00 GHz	800 MHz
Intel® Pentium® D	840	3.20 GHz	800 MHz
Intel® Pentium® D	820	2.80 GHz	800 MHz
Intel® Pentium® 4	670	3.80 GHz	800 MHz
Intel® Pentium® 4	661	3.60 GHz	800 MHz
Intel® Pentium® 4	560	3.60 GHz	800 MHz
Intel® Pentium® 4	530	3.00 GHz	800 MHz
Intel® Pentium® 4	520	2.80 GHz	800 MHz
Intel® Pentium® 4	506	2.66 GHz	533 MHz
Intel® Celeron® D	352	4.20 GHz	533 MHz

F.3 Compatible Memory Modules

NOTE:

The memory modules listed below have been tested on the IMBA-9654 other memory modules that comply with the specifications may also work on the IMBA-9654 but have not been tested.

The following memory modules have been successfully tested on the IMBA-9654

Manufacturer	Model No.	Capacity	Speed
Apacer	UNB PC4300 CL4	512 MB	533 MHz
Apacer	78.01G92.424 PC2-5300	2.0 GB	533 MHz
Kingston	KHX5400D2K2/2G	1.0 GB	667 MHz
Kingston	KHX5400D2K2/1G	512 MB	667 MHz
A-DATA	M2OEL5G3I4170C1C0 Z667(5) 1GX16	1.0 GB	533 MHz
UNIGEN	UG12T6400L8DU-5AM	1.0 GB	533 MHz
Transcend	TS128MLQ64V8J	1.0 GB	800 MHz

Transcend	TS64MLQ64V6J	512 MB	667 MHz
Transcend	TS64MLQ64V6J	512 MB	667 MHz
Transcend	TS32MLQ64V6M	256 MB	667 MHz
Elixir	M2U51264TU88A0F-37B	512 MB	533 MHz
CORSAIR	VS51MB667D2	512 MB	667 MHz
CORSAIR	VS1GB667D2	1.0 GB	667 MHz
CORSAIR	CM2X1024-6400C4 G	1.0 GB	800 MHz
KINGSTEK	KSTD2PC2-4200 1RX4U5R41	1.0 GB	533 MHz

Appendix

G

Intel® Matrix Storage Manager

G.1 Introduction

The Intel® ICH8DO chipset can provide data protection for serial ATA (SATA) disks via the Intel® Matrix Storage Manager using one of three fault-tolerant RAID levels: RAID 1, 5 or 10. When using two hard drives, matrix RAID allows RAID 0 and RAID 1 functions to be combined, where critical files can be stored on RAID 1, and RAID 0 can be used for non-critical items such as software. RAID 5 and RAID 0 can be combined to provide higher performance, capacity, and fault tolerance.

CAUTION!

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

G.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.

WARNING!

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

G.2 Features and Benefits

- Supports RAID levels 0, 1, 5 and 10
- Supports connectivity to two or more disk drives
- Supported Operating Systems include: Windows XP, Windows Server 2003 and Windows Vista

G.3 Accessing the Intel® Matrix Storage Manager

To access the Intel® Matrix Storage Manager, please follow the steps below.

Step 1: **Connect SATA drives to the system**. Connect two or more SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

NOTE:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 2: **Enable SATA drives in BIOS**. Start the computer and access the **BIOS** setup program. Enable **SATA** support for all IDE devices. Refer to the applicable BIOS configuration section in this user manual.

Step 3: **Save and Exit BIOS**. After the **SATA** support option is enabled, save and exit the **BIOS**.

Step 4: **Reboot the system**. Reboot the system after saving and exiting the **BIOS**.

Step 5: **Press Ctrl+I**. During the system boot process, press **Ctrl+I** when prompted to enter the RAID configuration software.

Step 6: **Configure the RAID settings**. Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.

Step 7: **Install the OS**. After the RAID array has been configured, install the OS. To do this, please refer to the documentation that came with the OS.**Step 0:**

G.4 RAID Configuration

G.4.1 Creating a RAID Volume

WARNING!

All data previously stored on the member drives of a RAID configuration are destroyed during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: **Select** "**Create RAID Volume**." Use the arrow keys to highlight **Create RAID Volume** and press **ENTER**. See Figure G-1.

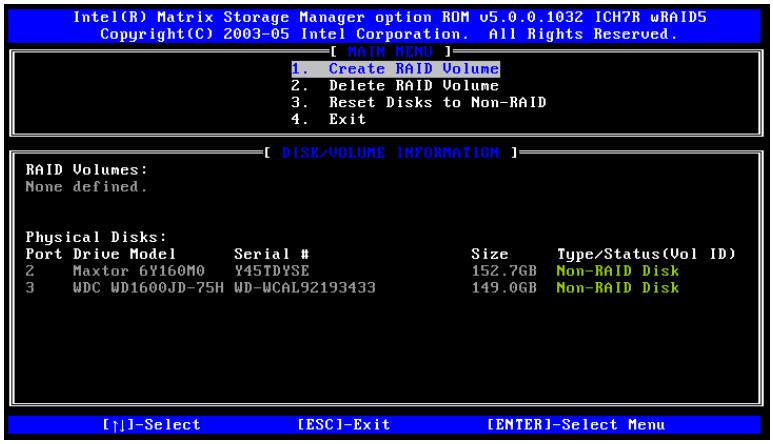
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
None defined.
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Non-RAID Disk
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-1: Matrix Storage Manager Main Menu

Step 2: **Name the RAID volume**. Enter a name for the RAID volume, or press **ENTER** to accept the default volume name. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array. See Figure G-2.

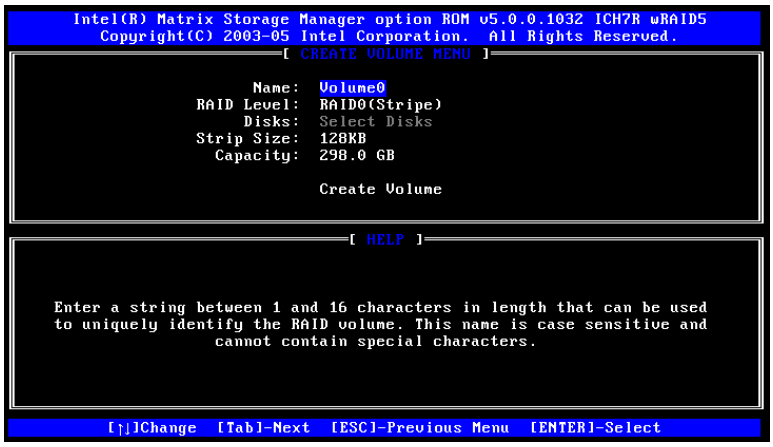
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and cannot contain special characters.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure G-2: Create RAID Volume Name

Step 3: **Choose the RAID level**. Select a RAID level from the list. RAID levels include RAID 0, 1, 5 and 10. See Figure G-3.

NOTE:

RAID 0 and RAID1 levels require a minimum of two hard drives.

RAID 10 level requires a minimum of four hard drives.

RAID5 level requires a minimum of three hard drives.

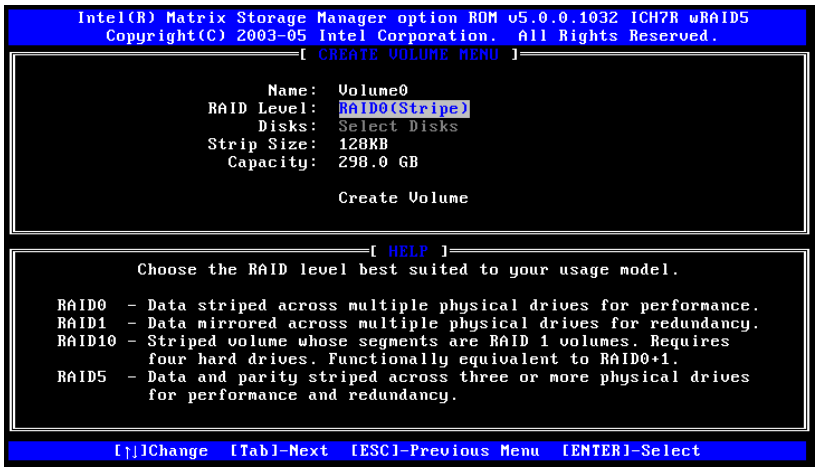
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Choose the RAID level best suited to your usage model.
RAID0 - Data striped across multiple physical drives for performance.
RAID1 - Data mirrored across multiple physical drives for redundancy.
RAID10 - Striped volume whose segments are RAID 1 volumes. Requires four hard drives. Functionally equivalent to RAID0+1.
RAID5 - Data and parity striped across three or more physical drives for performance and redundancy.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure G-3: Choose the Raid Level

Step 4: **Select the Stripe Size**. Select a stripe size from the list. See Figure G-4.

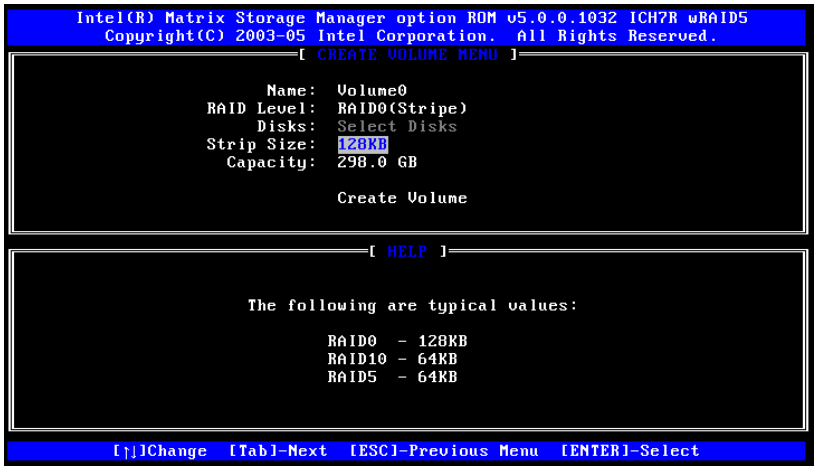

Figure G-4: Select the Stripe Size

Step 5: **Enter the Volume Capacity**. Enter the volume capacity, or press **ENTER** to accept the default capacity. See Figure G-5.

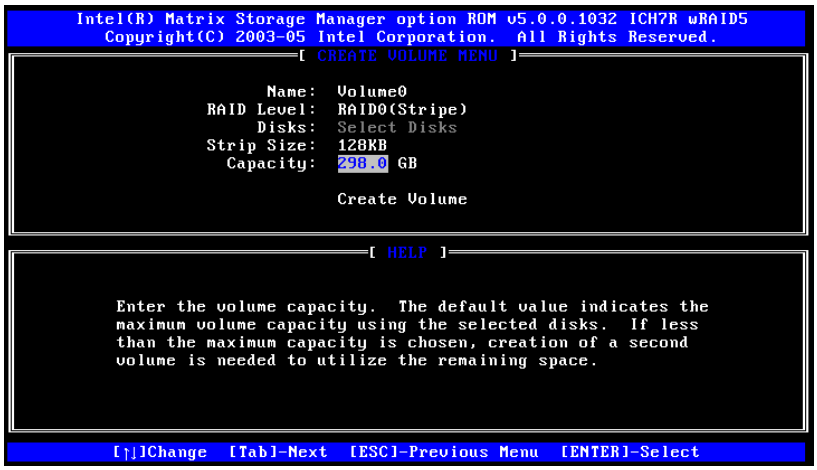
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Enter the volume capacity. The default value indicates the
maximum volume capacity using the selected disks. If less
than the maximum capacity is chosen, creation of a second
volume is needed to utilize the remaining space.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure G-5: Enter the Volume Capacity

Step 6: **Create the RAID Volume**. Press **ENTER** to create the RAID volume as specified. See Figure G-6.

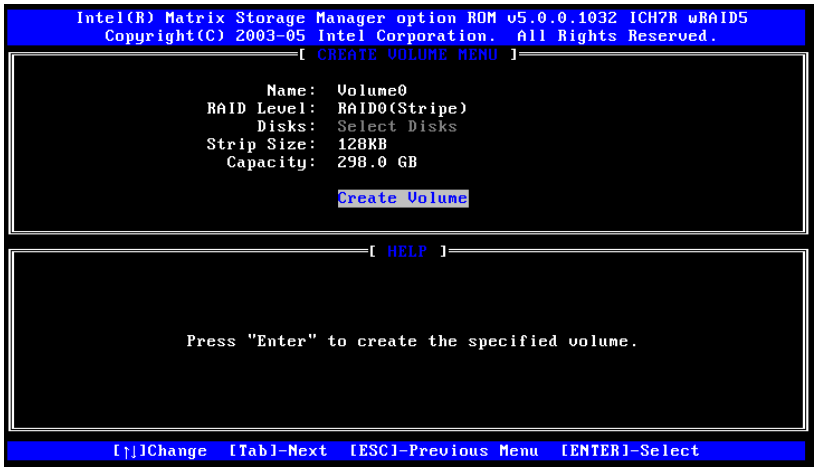
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Press "Enter" to create the specified volume.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure G-6: Create the RAID Volume

Step 7: **Create RAID Volume Verification**. After reading the warning, press **Y** to create the RAID volume as specified, or **N** to return to the **Create RAID Volume** menu. See Figure G-7. **Step 0:**

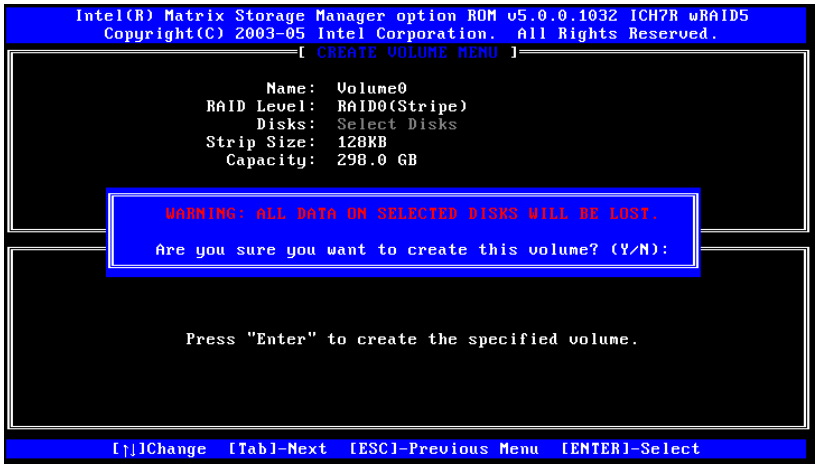
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.
Are you sure you want to create this volume? (Y/N):
Press "Enter" to create the specified volume.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure G-7: Create RAID Volume Verification

G.4.2 Deleting a RAID Volume

WARNING!

All data stored on the member drives of a RAID volume are destroyed during the RAID deletion process. Make sure any data to be saved has been moved or backed up before deleting a RAID volume.

Step 1: **Select** "**Delete RAID Volume**." Use the arrow keys to highlight **Delete RAID Volume** and press **ENTER**. See Figure G-8.

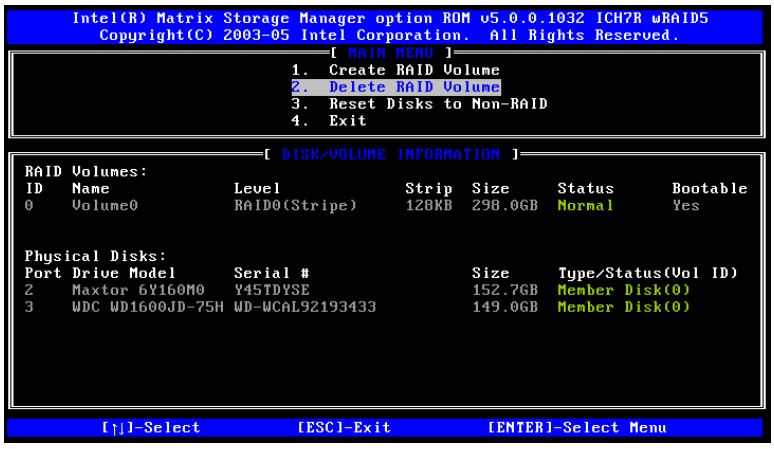
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Normal Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk(0)
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-8: Delete RAID Volume Menu

Step 2: **Select RAID Volume to be Deleted**. Use the arrow keys to highlight the RAID volume to be deleted and press **ENTER**. See Figure G-9.

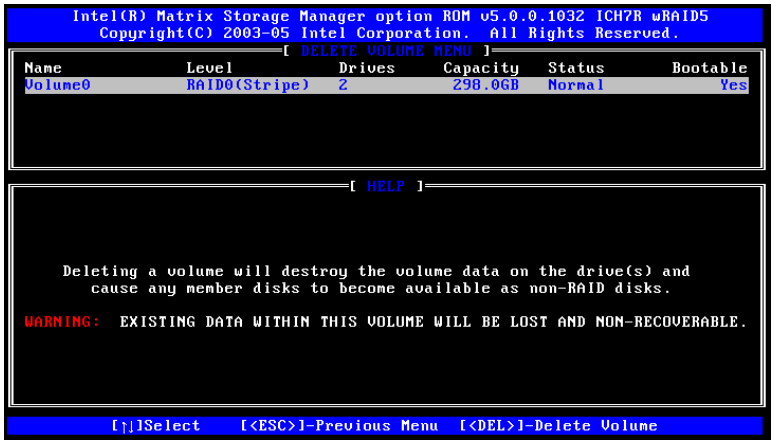
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[DELETE VOLUME MENU]
Name Level Drives Capacity Status Bootable
Volume0 RAID0(Stripe) 2 298.0GB Normal Yes
[HELP]
Deleting a volume will destroy the volume data on the drive(s) and cause any member disks to become available as non-RAID disks.
WARNING: EXISTING DATA WITHIN THIS VOLUME WILL BE LOST AND NON-RECOVERABLE.
[↑↓]Select [<ESC>]-Previous Menu [<DEL>]-Delete Volume

Figure G-9: Select RAID Volume to be Deleted

Step 3: **Delete Volume Verification**. After reading the warning, press **Y** to delete the specified RAID volume, or **N** to return to the **Delete Volume** menu. See Figure G-10.

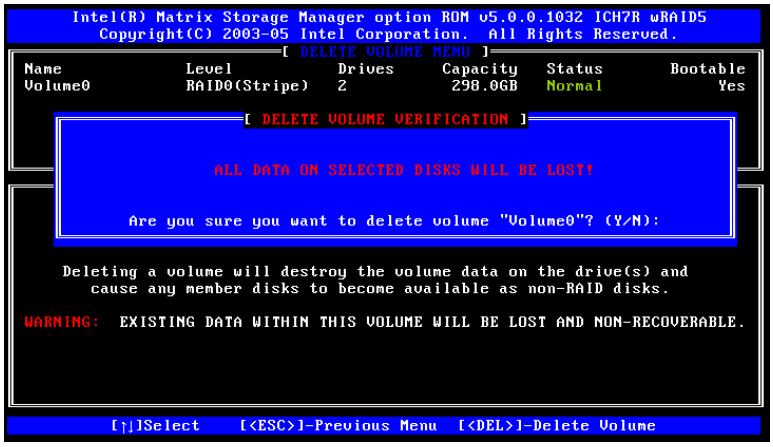
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[DELETE VOLUME MENU]
Name Level Drives Capacity Status Bootable
Volume0 RAID0(Stripe) 2 298.0GB Normal Yes
[DELETE VOLUME VERIFICATION]
ALL DATA ON SELECTED DISKS WILL BE LOST!
Are you sure you want to delete volume "Volume0"? (Y/N):
Deleting a volume will destroy the volume data on the drive(s) and cause any member disks to become available as non-RAID disks.
WARNING: EXISTING DATA WITHIN THIS VOLUME WILL BE LOST AND NON-RECOVERABLE.
[↑↓]Select [<ESC>]-Previous Menu [<DEL>]-Delete Volume

Figure G-10: Delete Volume Verification

Step 4: **Non-RAID Disks**. After deleting the RAID volume, the disks belonging to the volume will be shown as non-RAID disks. See Figure G-11. **Step 0:**

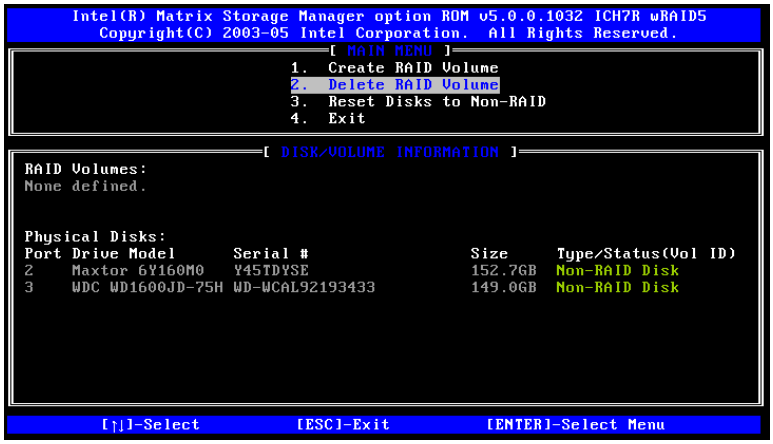
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
None defined.
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Non-RAID Disk
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-11: Non-RAID Disks

G.4.3 Resetting a Disk to Non-RAID

WARNING!

All data stored on the disk drive of a RAID volume is destroyed when resetting it to non-RAID. Make sure any data to be saved has been moved or backed up before resetting a disk to non-RAID.

Step 1: **Select** "**Reset Disk to Non-RAID**." Use the arrow keys to highlight **Reset Disk to Non-RAID** and press **ENTER**. See Figure G-12.

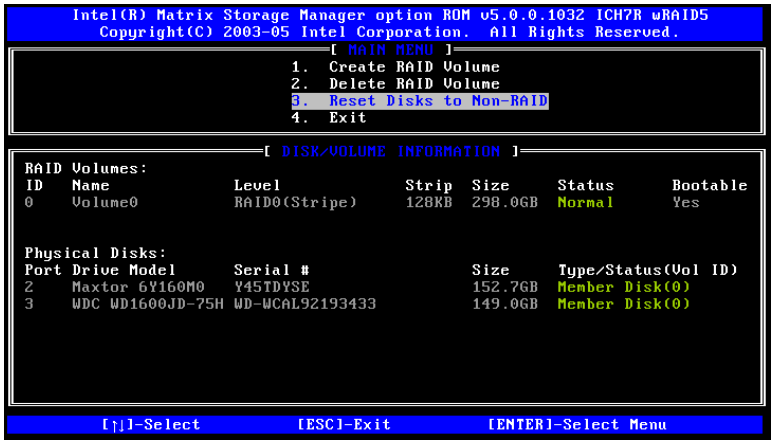
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Normal Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk(0)
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-12: Reset Disk to Non-RAID Menu

Step 2: **Select Disks to Reset**. Use the arrow keys to scroll through the disk drives and press **SPACE** to select which drives are to be reset as non-RAID. After all the disks to be reset have been chosen, press **ENTER**. See Figure G-13.

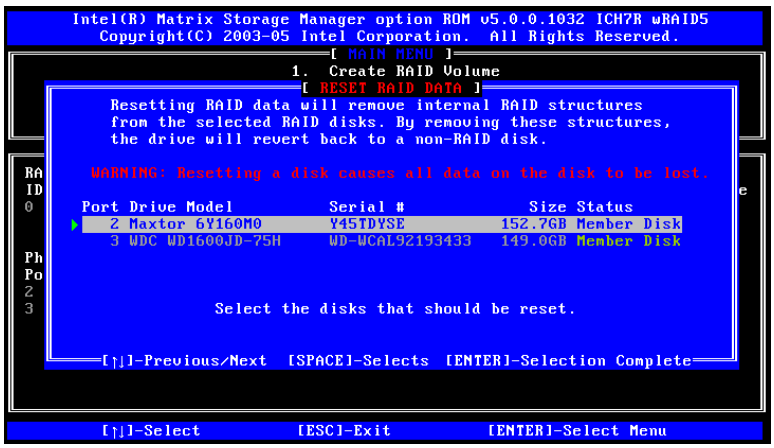
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
[RESET RAID DATA]
Resetting RAID data will remove internal RAID structures
from the selected RAID disks. By removing these structures,
the drive will revert back to a non-RAID disk.
WARNING: Resetting a disk causes all data on the disk to be lost.
Port Drive Model Serial # Size Status
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk
Select the disks that should be reset.
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-13: Select Disk to Reset

Step 3: **Reset Disk Verification**. After reading the warning, press **Y** to reset the selected disks as non-RAID, or **N** to return to the **Reset RAID Data** menu. See Figure G-14.

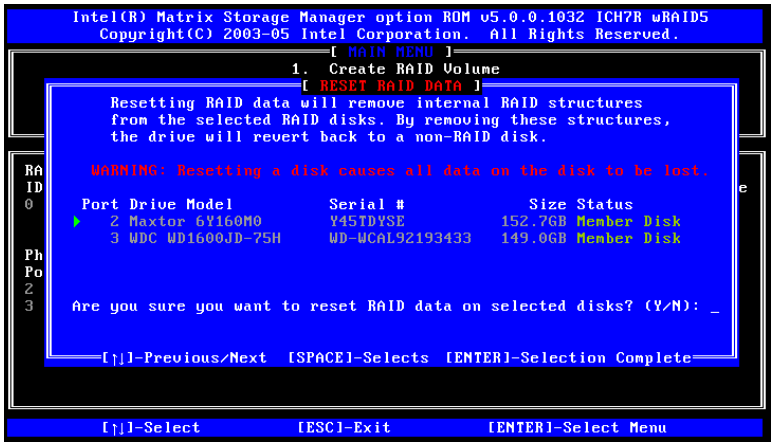
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
[RESET RAID DATA]
Resetting RAID data will remove internal RAID structures
from the selected RAID disks. By removing these structures,
the drive will revert back to a non-RAID disk.
WARNING: Resetting a disk causes all data on the disk to be lost.
Port Drive Model Serial # Size Status
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk
Are you sure you want to reset RAID data on selected disks? (Y/N): _
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-14: Reset Disk Verification

Step 4: **Disk Drive and RAID Volume Status**. After the disk drives have been reset, the **Matrix Storage Manager Main** menu is shown indicating the status of the RAID volumes and disk drives. See Figure G-15. **Step 0:**

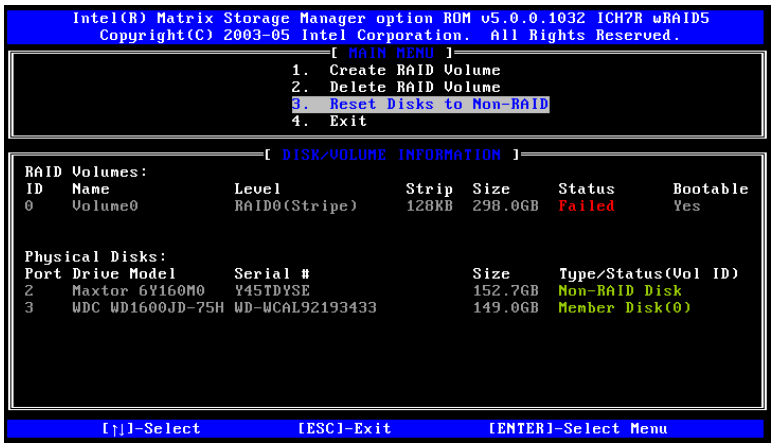
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Failed Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-15: Disk Drive and RAID Volume Status

G.4.4 Exiting the Matrix Storage Manager

Step 1: **Select** "**Exit**." Use the arrow keys to highlight **Exit** and press **ENTER**.

See Figure G-16.

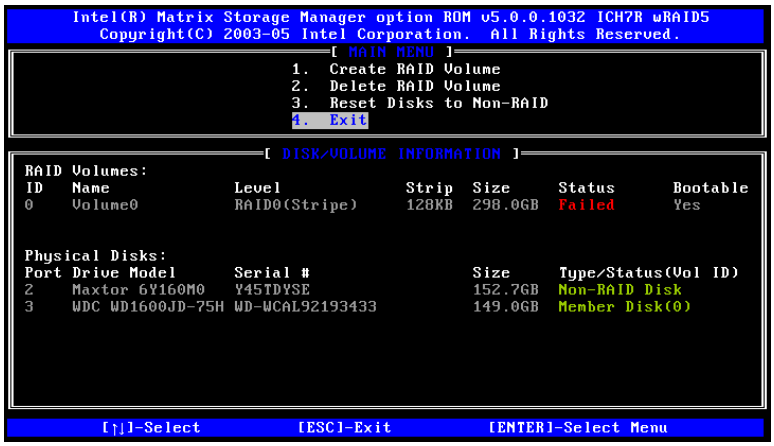
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Failed Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-16: Exit Menu

Step 2: **Exit Verification**. Press **Y** to exit the **Matrix Storage Manager**, or **N** to return to the **Main** menu. See Figure G-17. **Step 0:**

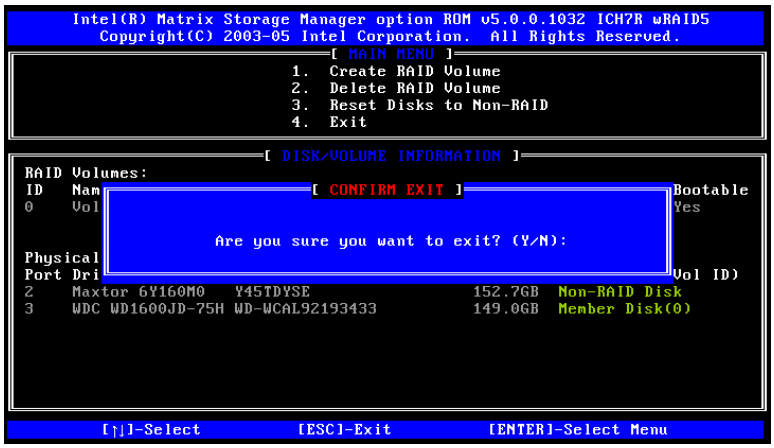
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
[CONFIRM EXIT]
Are you sure you want to exit? (Y/N):
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure G-17: Exit Verification

Appendix

H

Hazardous Materials Disclosure

H.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	x	O	O	O	O	x
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

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